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Abdominal and General Surgery

The Value of the Enema in Diagnosis and Treatment

JAMES F. BRAILSFORD, M D, Ph.D., F.R C.P., F.I.C.S. (Hon.)*

BIRMINGHAM, ENGLAND

THE physician or surgeon who desires any roentgen examination of the alimentary canal must furnish the head of the roentgen department with the request, a statement signed by him that a digital examination of the rectum has been performed. *This rule is suggested for use in all hospitals.*

The reason dictating the rule is that neglect of this essential prior examination has frequently resulted in failure to detect carcinoma in the rectum. A pertinent example follows:

A relative of my own, a woman, complained to her doctor that she was passing blood *per rectum* and had the continual sensation of a mass in the rectum. In the first instance she was given a month's trial with hemorrhoidal suppositories. These had no beneficial effect, and the complaint continued. With this knowledge I carried out a most careful barium enema investigation, which gave completely negative results. I therefore reported that the enema would not reveal a carcinoma which could readily be detected by a digital examination and advised that this should be done forthwith. It was not done, but the patient was referred to a leading gynecologist, who on examination detected a small ulcer on the posterior wall of the vagina which the surgeon reported to me. I urged that this would not cause the symp-

*Emeritus Director of Radiological Studies in Living Anatomy, University of Birmingham, Birmingham England

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toms, but I had to bow to the reply that it could and that the surgeon proposed to resect the ulcer. The ulcer was resected and was reported by the pathologist to be a columnar-celled secondary carcinoma from the bowel. The gynecologist now decided that hysterectomy should be done. I again urged that this lesion could not produce the symptoms and, further, that I could see no justification for hysterectomy. To this the reply was given that if the lesion was not as she (the doctor) suspected (a carcinoma of the uterus leading to a droplet infection of the vagina) the patient could be referred to a general surgeon. I insisted that a general surgeon should be present to continue the search if necessary. A laparotomy was performed, but it was reported that no sign of any primary lesion could be detected in the genital or the intestinal tract. In spite of this a hysterectomy was performed, and the uterus was observed to be normal. The two surgeons accordingly agreed (in spite of the histopathologic picture) that the lesion resected must have been the primary one and the hope was expressed that, as this had been entirely resected, no further spread would occur. Distressing thrombosis of the legs developed in the patient, and after prolonged invalidism she complained to me that she was still bleeding from the rectum and still had the sensation of a retained mass.

Assuming that a digital examination had been made by the surgeons before they undertook surgical exploration, I decided to carry out a further barium examination. This I did, with all care, fully aware of the persistence of signs and symptoms which, to me, definitely indicated a carcinoma while she was conscious. The patient was now referred to a general surgeon with this request and he observed, near the anus, an inoperable fungating carcinoma.

As such neglect of clinical examination can occur even in a modern teaching hospital, the need for enforcing the rule is apparent.

General Considerations. — The purpose of the investigation, as of any other roentgen examination, should be solely for the benefit of the patient, not the convenience or inquisitive interest of the doctor. The discipline of this doctrine should always be imposed on the clinician and radiologist. Roentgen rays should never be used as a substitute for more arduous and exacting clinical studies. They can be used to the patient's benefit only when they are regarded as merely an aid to clinical medicine. A careful roentgen investigation by a competent and conscientious radiologist cannot make amends for a poor clinical examination. In the nature of things, inadequate or careless clinical examinations are usually associated with equally unreliable roentgen examinations.

Preliminary Investigations.—Being assured that the clinician has carefully excluded a lesion of the rectum by digital examination (the radiologist must not rob the clinician of this essential discipline) and the bowel has been as efficiently cleared as possible by enemas, the radiologist can commence his investigation. Since opaque material will be used and may obscure important evidence obtainable by a prior plain roentgenogram, the latter should first be taken and examined. The chest and abdomen are commonly subjected to a preliminary fluoroscopic study, but this is not as good. Not forgetting the possibility of stones in the urinary, biliary and pancreatic systems, as well as disease of the spine and aorta, in surveying the preliminary film the most important evi-

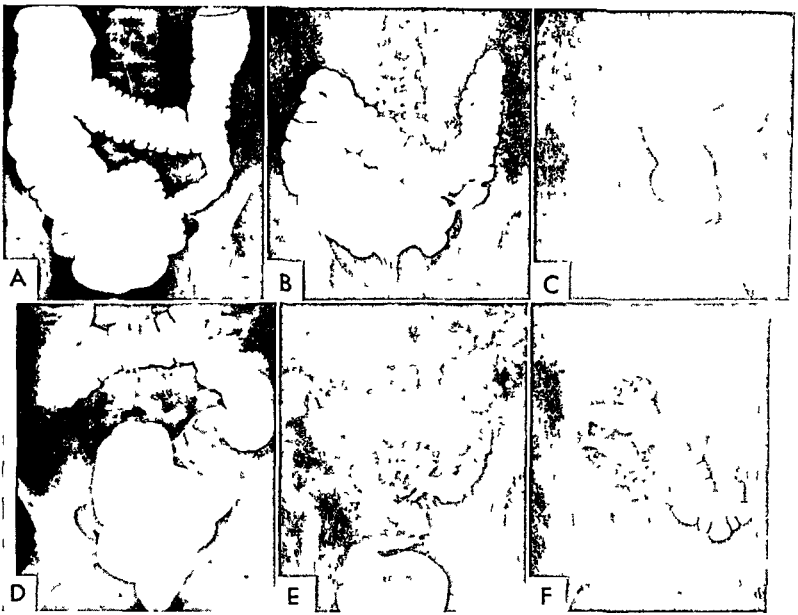


Fig 1.—*A*, roentgenogram showing large bowel filled with barium enema *B*, same patient after twenty minutes of attempting to evacuate barium Note large residue *C*, film showing obstruction to barium enema by carcinoma of sigmoid flexure. *D*, barium enema after passage beyond carcinomatous obstruction in lower segment of descending portion of colon Barium became desiccated, and death occurred a few days later *E*, film showing complete sigmoidal obstruction by inflammatory changes associated with diverticulosis and diverticulitis Barium enema could not be made to enter sigmoid portion of colon, nor could barium from a meal previously administered be made to pass into rectum *F*, film showing carcinomatous, irregular cecum filled with barium enema

dence one will find is concerned with the contents of the intestine, including feces, gas, medicinal agents and foreign bodies.

Feces: In some patients intestinal obstruction does not permit adequate cleansing of the colon, and the roentgenogram may show large masses of feces with more or less gas. In cases of chronic obstruction the bowel may be shown distended with feces which are impregnated throughout with small bubbles, i.e., gas-fermenting feces (Fig. 1*A*). This is not usually a sign of pathologic obstruction but signifies failure of function. In a patient who has been hospitalized for a long period it is a sign of neglect. Concomitant with the apparent lowering in the standard of nursing and medical supervision in modern times, more and more of such cases will be encountered, for the leakage of liquefied feces, associated with the passage of fetid gas from the over-distended colon and rectum, I have known to be recorded by the assistant nurses, to whom this duty is now too often relegated day after day, as normal bowel function. It would seem that with the introduction of mechanical cleansing of bedpans, the feces and urine of all pa-

tients are no longer put out for daily inspection by the doctor. In the days when the clinician had no roentgen, biochemical, physiochemical, psychological, pathologic, bacteriologic and other departments to do *his* work, careful daily routine inspection and observation were made of the changes in the urine, feces and sputum as well as in the general condition of the patient. It was these essential examinations by the clinician which permitted our illustrious predecessors to identify maladies and describe them so meticulously; the clinicians of today, aided and abetted (or is it hampered and deceived?) by the multitudinous modern tests, performed not by themselves but by their specialist colleagues, have been unable to add any further evidence of real benefit to the patient. Infallible evidence has been supplied by the highest authority that, in a hospital with all the so-called modern specialist staff and paraphernalia, it is possible for clinical examination of the patient and of the bowel movements to be so neglected that at death, caused probably by toxic absorption, the otherwise normal bowel was so distended with decomposing feces that the abdomen presented the superficial appearance of a full-term pregnancy. Though grave toxemia due to retention of feces, resulting eventually in death, has been recognized by many clinicians for many centuries, it is unfortunately not uncommon for gross neglect of the bowels to be overlooked in hospitals in these days, when the more modern investigations and technics are practiced for the common ailments—fractures, etc., and conditions associated with toxemia and degeneration.

whole of the large bowel. Apparently under the impression that a short circuit of the small intestine into the pelvic portion of the colon would lead to disuse atrophy of the bowel, this operation was performed. For such operations surgeons overlooked the phenomenon of reverse peristalsis, by which the contents of the distal portion of the bowel can be carried backward to the cecum and even the small intestine (Fig. 1, *B* and *C*). In some cases in which the enema is held up in the distal portion of the colon on attempts to evacuate, the barium paste passes backward to the cecum (Fig. 1*C*). I have seen the cecum and colon markedly distended with decomposing feces and the patient showing signs of toxemia though he had a working short circuit between the small intestine and the pelvic portion of the colon, with the ileocecal valve ligated. One such person was so depressed that he committed suicide.

The plain roentgenogram may occasionally indicate the site of the obstruction, but usually it does not provide convincing proof of its nature, unless it be from a large gallstone or a foreign body. If bismuth or barium has been previously administered (Fig. 1*D*) this may be seen to add to the opacity of the feces or to be lodged in the diverticuli. Foreign bodies may be of any nature. They may have been accidentally or purposely introduced or swallowed. In the mentally sick the variety and quantity of such objects may be beyond what is considered consistent with life (Fig. 1*E*). Such experience enables one to quiet the fears of the anxious mother of the child who has swallowed a small button or coin, since these things are usually voided without difficulty. I have known the stomach of a child unsuccessfully explored surgically for a sixpenny piece that had been voided from the rectum during the operative procedure.

The possibility that the foreign body or

bodies may have been left behind during a previous operation must be borne in mind, as must also be the fact that the patient may, by secretly swallowing metal tags similar to those which some surgeons affix to mops for roentgen identification, suggest that the surgeon has been neglectful By keeping the patient under observation and repeating the roentgen examination at intervals it is possible to detect this fraud I once provided adequate proof that a patient had repeatedly voided and swallowed such tags to establish the surgeon's guilt, no further threat developed after the deceit had been exposed

Cleansing of the Bowel—Since the commonest cause of intestinal discomfort is constipation, with the purgatives used to combat it, cleansing of the bowel should be the primary treatment With cleansing by simple enema the signs and symptoms disappear in a large proportion of cases, and all other investigations are avoided This fact has been known for many centuries, indeed, the enema is one of the oldest forms of treatment, one which the ancient Egyptians are said to have practiced regularly It fell into disuse because

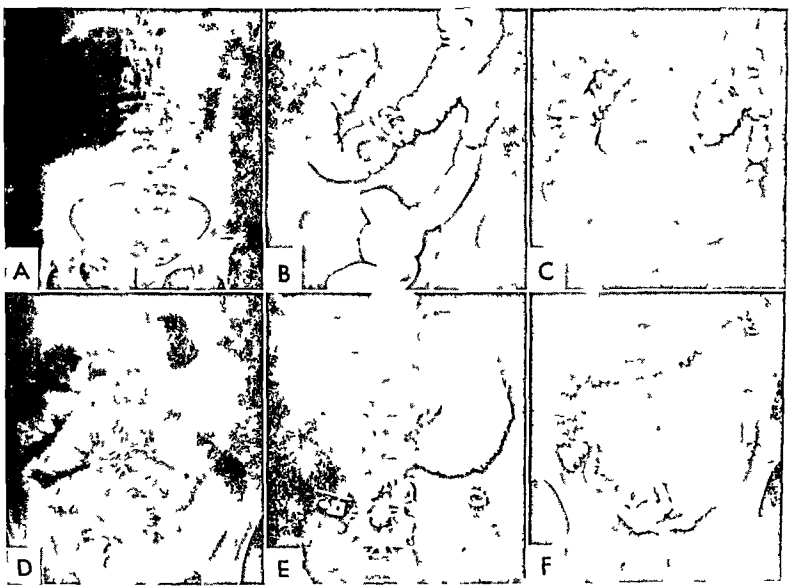
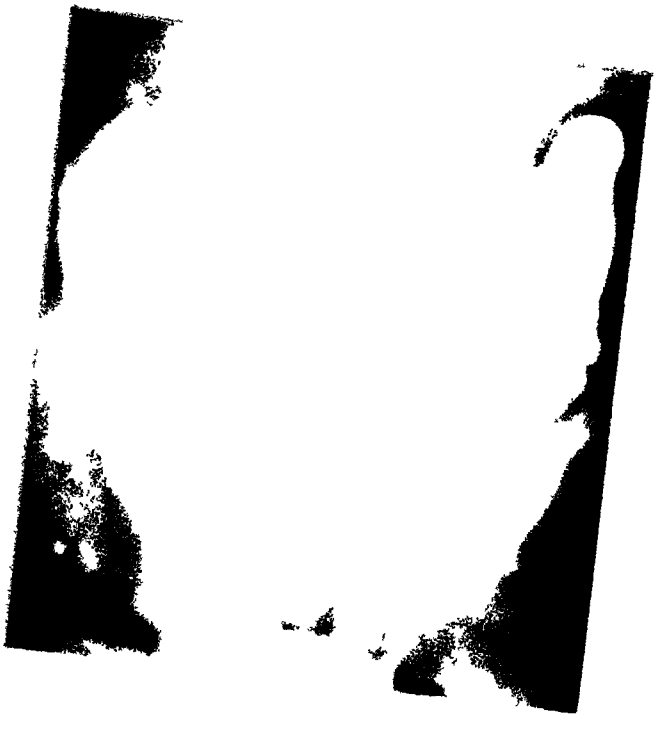


Fig 2—*A* roentgenogram showing large accumulation of gas in region of hepatic flexure and distention of remainder of large bowel, with fermenting feces *B*, enema held up at hepatic flexure by feces and gas, which are also apparent in transverse portion of colon *C*, roentgenogram of same patient after attempt to void enema Note that barium had passed on to cecum Obstruction was due merely to feces and gas *D*, film showing barium held up in distended small intestine by obstruction at ileocecal valve *E*, film showing mass of needles pins, safety pins, drawing pins, paper fasteners, nuts and bolts in stomach and intestines Mass weighed several pounds after surgical removal Patient made complete physical recovery *F* film showing outline of intestinal mucosa immediately after enema was voided



the cecum, there is something to be said for giving it in a good light so that the reactions of the patient can be watched, the injection checked and the fluoroscope applied in case the patient mentions any pain If the enema is held up at any point a roentgenogram should be taken (Fig 2*C*) Forcing the enema beyond the obstruction by increasing the pressure may permit the barium to pass beyond a carcinomatous obstruction, and subsequent evacuation of the desiccated barium may be difficult I have known such a procedure lead to the death of a patient within a week (Fig *D*) The colon having been filled, the patient can be rotated during the screening so that the details of all the flexures are visualized and roentgenograms of any abnormal feature can be taken for the record

The roentgen examination completed, the patient is taken to the toilet for evacuation and instructed not to be in any hurry After evacuation, further radiographic study of the colon will reveal the extent of the evacuation and the presence of any irregularity in retention Olive oil enemas should be administered to assist evacuation of any barium residue To illustrate examples of the many lesions that have been so demonstrated would need the many pages of an atlas, and these cannot be given to this article Plates *E*, *F* and *G* (Fig 2) illustrate a few typical lesions Even if such a volume could be included, it could not present examples identical to those with which the student will be confronted It has been my experience that, no matter how carefully a lesion is described, the inexperienced may identify it with something entirely different The interpretation will separate the extrinsic (pressure deformities and obstruction due to abscess, cyst, aneurysm, benign or malignant lesions) from the intrinsic The latter will include foreign bodies, worms, etc, malformation in development associated with obstruction, volvulus, hernia and intussusception, irregularities due to pyogenic, tuberculous or actinomycotic ulceration and simple or malignant growths associated with obstruction, intussusception, perforation and pneumoperitoneum These often have characteristic radiographic features that permit accurate diagnosis only by the experienced observer, but the interpretation is always facilitated by a prior careful clinical history and examination for this alone may enable the clinician to clarify a complicated picture

SUMMARY

The author stresses modern neglect of the enema, one of the oldest known forms of treatment and also one of the most useful, stating that the multitudinous modern specialized diagnostic tests tend to deprive the physician and surgeon of the diagnostic acumen often displayed by those of former years, who did not have this variety of tests available and therefore were compelled to develop their judgment to the utmost

Both the ordinary cleansing enema and the enema given with an opaque medium, such as barium, in roentgenographic diagnosis are discussed In the author's opinion, neglect of the former has led to carelessness and negligence in examining the patient's feces With regard to the latter, he points out that all roentgen procedures are incapable of benefiting the patient unless used for what they actually are, aids to diagnosis and treatment and not treatment itself

ZUSAMMENFASSUNG

Der Verfasser weist darauf hin, dass in neuerer Zeit die Anwendung des Darmeinlaufs, eines der altesten und gleichzeitig nutzlichsten Behandlungsmittels, vernachlassigt wird und macht die Feststellung, dass die Fulle moderner spezialistischer

Constitutional Body Factors and Fluid Balance Among Puerto Ricans

A Critical Evaluation

FERNANDO ASCENCIO, M.D., F.A.C.S., F.I.C.S.

BAYAMON, PUERTO RICO

EVERYDAY practice develops an unconscious identification with constitutional pathologic changes. There are body factors that influence disease. Fluid balance in the physical structure of the patient is a variable clinical picture that may be upset by other conditions underlying it.

An approach to this observation was made by examining every ambulatory patient for pitting edema of the inner tibial surfaces of the shins and evaluating his body build as to height and weight in proportion to age. An interrogation of much importance in taking each history was whether the patient had gained excessive weight since the age of 21 or had been overweight for years. A physical evaluation of the anthropometric measurements was made by placing emphasis on structure as the basis of information.

Overweight persons who have gained weight recently assume bizarre body shapes—the "barrel body" type; the type with deposition of fat along the hips, coalescing the buttocks and the lumbar areas; the type with thin legs, thin arms and a rounded chest and abdomen, and the tall type with thin legs and a round abdomen.

Edema of the tibial surfaces of the leg and ankle may be one of the first observable signs of failing health in any of these patients. This sign need not be ascribable specifically to cardiac or nephrotic disease, as my abstracting tendency led me at first to assume.

An examination of the eyegrounds of young patients has additional importance, arousing suspicion of the retinal changes depicted in classic retinoscopic pictures as characteristic of nephrosis or renal inflammation.

Besides, the conduct of a physical examination by the accepted traditional method, rejection of the much claimed importance of laboratory data and visualization of the physical structure of the patient are of far greater aid to the abstracting capacity of the physician in this particular problem than is dependence on modern but artificial devices.

Since the majority of my patients are emotional, with low cortical levels, their histories are consistently inaccurate. Yet there is much hidden history among them of acute attacks of pyelonephritis associated with tonsillitis, or acute pharayngeal infections during childhood or preadolescence. These conditions have failed to heal properly and recur, with insignificant reactivation, from time to time.

If one pictures the colloidal behavior of such a pathologic condition as glomerulonephritis or acute chronic renal impairment, one can reason that much of what goes on is a process of delayed healing after the infection has subsided. A process of scarring, cloudy swelling and tubular degeneration recurs in proportion to the

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dulgence in exercise and excessive salt intake that increase the fluid content of the body. The water intoxication that follows the drinking of alcoholic beverages, as well as premenopausal symptoms associated with an increase in body fluids, may be due to hypothyroid dysfunction. These are conditions invariably associated with dependent edema of both legs or even with moderate swelling of the ankles. There are other characteristic types: myxedema in patients in the late thirties; beriberi; forms of undernutrition; cortisone toxicity; childhood pyelonephritis; water intoxication in the patient with petit mal, and hypertension in obese patients in whom the predominant features of dependent edema may have a renal or a cardiac origin.

Again, in terms of colloidal behavior, it is assumed that most infections of the kidney, whether in the young or in the mature, have a residual glomerular sensitiveness to pathologic behavior. A degree of allergy of the upper part of the respiratory tract in some cases can be traced to a Fanconi syndrome and its clinical variants, or vice versa. A constitutional tendency to water-logging may go unnoticed for years, even by the clinician. Multiparity in a woman of short stature with a small pelvis and a history of difficult deliveries is a potential cause of the renal syndromes.

Overweight persons in Puerto Rico, who struggle with constant devitaminization through their overstrained sweating mechanism, apparently are subject to water intoxication through much sodium depletion as well. Among the slender, asthenic body types, a physiologic adjustment to dehydration seems to occur, which also apparently behaves in a reverse manner.

For several years I have been interested in the mental lassitude of rural Puerto Ricans, who are erroneously called lazy in their habits of living. Rural lassitude is a clinical symptom of dehydration, a chronic form of stress muscular syndrome associated with the depletion of vitamins and minerals in the body. They are thin, frail, slender and undernourished, and their slow reactions apparently impair their efficiency. Most laborers in sugar cane and plowers with oxen have slow reactions, a sort of mental dullness with regard to immediate action. The eyes are sunken; the sense of taste is blunted Constant replenishing of the body with water depletes the sodium content of the body, and the output of urine is lessened. Muscle fatigue is evident, and chronic exhaustion induces anorexia. Yet these people carry out their work without being too conscious of their limitations. The yield of labor per hour, of course, is not measurable with that of other types, whose output of work is greater in a shorter working day.

The worker who has a low threshold of body resistance is usually inclined to seek invigoration by alcohol, only to increase the derangement of cerebral cellular metabolism. Among the prevalent social peculiarities are delusions, an irrational attitude toward law and order, and obsessions, which are the sequelae of neurasthenia and physical strain. Several years ago the problem of neurasthenia in the tropics was discussed in a well-written article in a Manson's textbook of tropical diseases. The discussion was directed toward the clinical features of disease among white persons as they adapt themselves to the tropics for long periods.

The author of a report of the McCance syndrome, described more recently in England, studied the colonial native tropical reactions as well. The sodium depletion syndrome should find wider fundamental acceptance among Puerto Rican doctors, who face this problem daily among the rural population, than it has done in the past. It is a physiologic pattern of tropical adjustment assumed by

degree of repeated trauma inflicted upon the body structure. There is no speculation in the fact that many chronic illnesses follow a parabolic circularity of remission. This does not hold true exclusively of mental diseases, but of heart conditions, postmenopausal conditions and other chronic illnesses in which an organ of the body displays the outstanding clinical manifestations. An interesting example can be found in the many acute forms of diabetes observed in persons past the age of 50, or, shall I say, clinically emotional glycosuria of the aged, which I encounter often as a mild condition preventable by diet restrictions and psychologic advice.

Pathologic studies of ambulatory diabetic patients have recently been made. Biopsy puncture with the Fransen needle has revealed various levels of nephrosclerosis in a nodular exudative form. Anderson of Durham, England, and Taft Finilh and Joske of Melbourne have described the colloidal behavior of a pathologic process that goes on without apparent external clinical manifestations.

The laboratory idea of expecting a urinalysis or a chemical test of the blood to settle all fundamental questions about renal damage is inadmissible at all times, except in cases of acute disease. The majority of chronic diseases have a circular pattern of behavior, and, as has been said before, many personal habits of the patient encourage acute exacerbations, the early symptoms of which are present and unconsciously tolerated before the patient ever comes to see his doctor. The new term "colloidal behavior" could be synonymous with the physical principles involved in disturbances of acid-base balance and expressed in the ratio of $\frac{BHCO_3}{H.HCO_3}$ of $\frac{25}{125}$ or $\frac{20}{1}$ in an intracellular *p*H of 7.4. This mechanism expresses the concentration of fixed cation covered by bicarbonate anion in the kidney.

The hydrostatic pressure in the capillaries caused by the passage of fluids from the interstitial spaces in the circulation is an osmotic process that bears out mathematical reasoning, for the loss of sodium or the gain of potassium is a pertinent fact, dependent on cellular dehydration.

During World War II a vigorous interest in the study of electrolytes and dehydration of the body in servicemen under war conditions stimulated investigation in Germany, with the discovery of plasma expanders and numerous clinical problems which can be explained by physiochemical principles only, when mathematical precision appears exacting.

In no other sphere of physiologic investigation could one be so dependent on osmosis as the measure for hydrostatic pressures of body fluids and circulation fluids. The clinical results of many of these experimental confirmations have far-reaching value in the analysis of clinical syndromes coincidental with constitutional body patterns. Recently a new angle on the aldosterone output has appeared to throw some light on the mechanism of sodium conservation.

Elevated hydrostatic pressure, increased capillary permeability and decreased plasma colloid pressure, associated with low tissue pressure, are physical factors associated with most pathologic edematous conditions. It seems there is another underlying factor, an incipient stage that provides for an abnormal salt-retaining activity of the body.

The isolation of aldosterone seems to indicate differences between normal and pathologic state and the major factor in the normal mechanism of sodium conservation.

There are many symptoms of heavy body strain through hard work, pleasurable in-

dulgence in exercise and excessive salt intake that increase the fluid content of the body. The water intoxication that follows the drinking of alcoholic beverages, as well as premenopausal symptoms associated with an increase in body fluids, may be due to hypothyroid dysfunction. These are conditions invariably associated with dependent edema of both legs or even with moderate swelling of the ankles. There are other characteristic types: myxedema in patients in the late thirties; beriberi; forms of undernutrition; cortisone toxicity; childhood pyelonephritis; water intoxication in the patient with petit mal, and hypertension in obese patients in whom the predominant features of dependent edema may have a renal or a cardiac origin.

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the impoverished laboring class. Others, even physicians, are unaware of this, because the trend in medical training is far away from constitutional pathologic change. The patient has a fixed habit of devitalizing his body with coffee and cigarettes until his chronic anorexia deters him from eating nourishing food or drinking enough water. His skin shrivels and hardens, and he presents a prematurely aged appearance. Papillary lesions of the tongue, deficient salivation and flatulence are common, together with much disinclination to brisk activity.

A study of 125 patients has been made under special clinical management, with treatment by forced physiologic hydration. This hydration is parenterally administered by intravenous hypervitamin injections with insulin. The dose of insulin varies from 10 to 20 units and is blended with heavy doses of Vitamins B and C; thus, glycogenolysis is produced in half an hour

The patient is stimulated in such a way as to induce gastric dilation, and he regains an immediate urge to overeat. The sweating mechanism is intensified, and the body is thrown into light insulin shock. Hunger or food intake is so strong that the reaction to overfilling of the stomach produces a restful sleep afterward.

Given at weekly intervals, this treatment has aided greatly in lessening the indolence of the patients, since the body is stimulated by prolonged persistent hydration.

Nicotine gastritis is commonly associated with undernourishment. With the anorexia due to indulgence in coffee and cigarettes, the patient presents a roentgen picture well described as hypertrophic gastritis associated with the "fingerprint" defect of the small intestine. An ulcer syndrome is the apparent complaint.

The "fingerprint" pattern, described by roentgenologists as occurring in persons who are inveterate smokers and who eat but lightly, is apt to exist also in a person of asthenic physique with a nervous personality, hypotension and bradycardia.

In the Puerto Rican laborer the characteristic lassitude develops during adolescence and is regarded by psychologists as normal. A theory is put forward that gonadal development depresses the function of the adolescent thyroid, making all boys and girls susceptible to day-dreaming, exhaustion and paradoxical extremes of behavior with regard to pleasurable habits.

One realizes that in a healthy adolescent the body metabolism is normal and the fluid balance is well established, and, though the intake of food and sweets surpasses the consumption of the body energy, with no defined endocrine balance, the skin is smooth and youthful, with the proper secretion of moisture. As age increases gonadal development is depressed, and the thyroid function tends to overpower the gonadal energy, clinically speaking. Yet in most of these cases mild myxedematous changes are observable in the general body structure of many of my routine patients. Sometimes a young woman or a healthy elderly man is suddenly bereft of freshness and vigor and precipitated into a state of malnutritional deterioration. With young women, early marriage predisposes toward deterioration of growth if pregnancy offsets this metabolic mechanism. Some patients have intractable anemia that fails to respond to hematopoietics, whether these are given orally or by parenteral injection. Others remain thin, with shriveled skin and a pasty pallor, and carry on normal lives. Others shift from the thinness of adolescence into obesity, with myxedematous hypotension and loss of physical energy. For the last-mentioned type, the increase in fluid volume is a bothersome detractor from the satisfactory performance of daily activities.

SUMMARY

Since the successful approach to therapy consists in a practical visualization of the patient's constitutional structure, habits and relations with his environment, a physiologic evaluation is made of fluid imbalance as a clinical symptom *per se*.

It is suggested that sometimes the classification of diseases by the standard, accepted educational method may become confusing, and that a clearer evaluation of syndromes could be made by returning to a physiologic rationale. This will clear up many doubtful problems encountered in everyday practice that do not agree with traditional concepts of appraisal and diagnosis.

The term "colloidal behavior" expresses a wide concept of what is [illegible] continuously in the body from [illegible] inward and throughout the met[illegible]ess. It leads the investigator t[illegible]itical-pathologic concept, w[illegible] that scientists should appra[illegible]tion not as a classified enti[illegible] individual derangement resu[illegible]con-stitutional developme[illegible] or the experimental anim[illegible]

This form of biologi[illegible]nu-lated by Einstein bef[illegible] pro-vides an approach to r[illegible]pre-cise study of patholog[illegible] the body.

ZUSAMMENFASSUNG

Da der Weg zu erfolgreicher Behandlung von einer praktischen Erfassung der Konstitution, der Lebensgewohnheiten und der Beziehungen des Kranken zur Umwelt seinen Ausgang nimmt, unternimmt der Verfasser eine physiologische Auswertung der Flüssigkeitsbilanz als klinisches Symptom *per se*.

Er deutet an, dass die Klassifizierung von Krankheiten nach den von unseren Medizinschulen angenommenen Standardmethoden manchmal verwirrend sein kann, und dass durch Ruckkehr zur Physiologie sich eine mehr philosophische Auswertung von Symptomenkomplexen erreichen liesse. Auf diese Weise lassen sich viele in der täglichen Praxis auftretende zweifelhafte Probleme aufklaren, die mit den überkommenen Vorstellungen der Diagnostik nicht losbar sind.

Der Ausdruck "kolloidales Verhalten" gibt eine umfassende Vorstellung von dem wieder, was sich fortgesetzt im Korper von der Haut bis ins Innere und durch alle Stoffwechselvorgange hindurch abspielt. Wir gelangen so zu einer mathematischen Auffassung der Pathologie, die zeigt, dass der Wissenschaftler nicht alle Funktionsstorungen als klassifizierte Tatsachen sondern eher als individuelle Abweichungen ansehen sollte, die sich aus der konstitutionellen Entwicklung des Tieres oder des Kranken ergeben.

Diese Form der biologischen Relativität, die Einstein vor seinem Tode formuliert hat, bietet den Zugangsweg zu physikalischem, mathematisch genauem Studium pathologischer Vorgänge im Korper.

RIASSUNTO

Poichè ogni indirizzo terapeutico richiede un esame costituzionale del malato, delle sue abitudini, dei suoi rapporti con l'ambiente, è opportuno valutare fisiologicamente il suo bilancio liquido come segno clinico a sè stante.

E' possibile che a volte la classificazione nosografica, fatta con i consueti schemi didattici, non sia sufficientemente chiara, e pertanto può rendersi necessaria una valutazione fisiologica della sindrome. Questa potrà chiarire molti dei problemi pratici che non quadrano con i concetti tradizionali.

Il termine di "comportamento colloidale" esprime un vasto concetto relativo a quanto accade continuamente nell'organismo fra la cute e gli organi e attraverso

i processi metabolici. Esso conduce a una concezione matematica della patologia secondo la quale le disfunzioni non devono essere valutate come fatti classificati ma come deviazioni individuali basate sullo sviluppo costituzionale.

Questa forma di relativismo biologico, formulata da Einstein prima della sua morte, fornisce una base per uno studio fisico, matematicamente preciso, dei processi morbosi.

RÉSUMÉ

Le succès de toute thérapeutique étant subordonné à une connaissance approfondie de l'état constitutionnel du malade, de ses habitudes et de son milieu, l'auteur présente une étude de l'équilibre des liquides en tant que symptôme proprement dit.

L'auteur estime qu'une classification des maladies d'après un système standard établi peut donner lieu à des confusions, et qu'il serait bon de procéder à une évaluation philosophique des syndromes en retournant à la physiologie. Cette méthode est susceptible d'éclairer plus d'un problème épineux dans la pratique quotidienne sortant du cadre des conceptions classiques du diagnostic.

Le terme de "comportement colloïdal" est une idée générale vaste de ce qui se passe continuellement dans l'organisme, de la peau jusqu'aux organes internes, en passant par les divers métabolismes. Elle conduit à un concept mathématique de la pathologie et montre que l'homme de science ne devrait pas apprécier toute dysfonction selon une classification établie, mais qu'il devrait au contraire fonder son jugement sur le développement constitutionnel individuel du patient ou de l'animal.

Cette forme de relativité biologique, formulée par Einstein, nous conduit à une étude physique, d'une précision mathématique, des processus pathologique de l'organisme.

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The battle against polypharmacy, or the use of a large number of drugs (of the action of which we know little, yet we put them into bodies of the action of which we know less), has not been fought to a finish.

Do not rashly use every new product of which the peripatetic siren sings. Consider what surprising reactions may occur in the laboratory from the careless mixing of unknown substances. Be as considerate of your patient and yourself as you are of the test tube.

—*Osler*

Ileostomy: Refinements in Technic

MIGUEL A VALIENTE, M D, M S F I C S

SAN JUAN, PUERTO RICO

FOR years the establishment of an ileostomy has been the major objection to operations associated with total colectomy and proctectomy As time passes, the technic of management of the ileostomy and its stoma has progressed to such a point that it no longer constitutes a major problem for either the patient or the surgeon The advent of the different ileostomy appliances and the improvement in surgical technic in construction of the ileostomy stoma have almost completely eliminated these problems There still remains an obstacle, however hesitancy on the part of the patient to adjust himself to a permanent ileostomy and its care Almost universally, ileostomized patients are happy and completely satisfied once this mental adjustment has taken place, they know themselves to be improved in general physical condition, and the fear of disease that requires this type of surgical treatment must be eliminated Nevertheless, I am convinced that future patients of this kind would welcome a procedure by which the anus, with its sphincter mechanism, could be preserved

Various operations have been undertaken for this purpose, e g, temporary ileostomy followed later by reestablishment of intestinal continuity, partial resection of the bowel and "pull-through" of the ileum, with ileoanal anastomosis Thus far, however, these operations have proved unsuccessful in a large percentage of cases

The first reported case of anastomosis of the ileum to the anus was presented by Nissen[1] in 1933 In this case a double-barreled loop of ileum was anastomosed to the anus through a sacral approach Ravitch,[2] Wagensteen,[3] Best,[4] Devine[5] and Casanova Diaz[6] cited a total of 34 cases in which they claimed satisfactory results in 20 instances and unsatisfactory results in the other 14 From their experiences it seems that the patients who fared best were those with an ileostomy or an ileosigmoidostomy that had been established for some time prior to the ileoanal anastomosis The number of bowel movements and the irritation to the anal and perianal regions by the ileal contents were minimal This, of course, is understandable, since the ileum has been conditioned to take over the water-absorbing action of the proximal portion of the colon Babcock[7] performed the operation in 3 cases, in 2 of which it was necessary to change to an abdominal ileostomy and in the third of which the patient died Payne and Hay[8] both reported one case in which replacement to the abdomen was necessitated Casanova-Diaz[6a] in 1 case made a longitudinal incision in the antimesenteric border and several circular incisions in the distalmost portion of the ileum, in such a fashion as to transect the muscle fibers This was done in an attempt to slow down the motility of the bowel He obtained gratifying results, but unfortunately an abscess developed between the ileum and the rectal stump

A list of the main problems associated with this type of procedure includes frequency of bowel movements, excoriation of anal and perianal skin, anal fistulas and abscesses, electrolyte and fluid imbalance, abdominal pain and cramps It seems log-

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ical to assume that if the number of bowel movements is diminished to a reasonable minimum the major portion of these problems will be solved.

This article deals with a proposed pull-through (ileum through anus) with preservation of an intact sphincter mechanism and a side-to-side ileoileostomy, the purpose of which is to establish a pouch that would serve as a reservoir for ileal contents. This pouch would obviate the almost constant need to evacuate the bowel. The pouch is constructed by a technic similar to that used in the so-called pantaloon procedure for total gastrectomy. It is my opinion that, if an adequate pouch can be obtained and the sphincter mechanism preserved intact, it would be possible for the patient to retain the ileal contents to such an extent that no more than three or four bowel movements daily would be involved.

The operation was performed experimentally on dogs, with the following technic: The colon is mobilized completely. The distal portion of the ileum is partially mobilized in such a fashion as to allow enough bowel to reach the anus. A pouch about 6 inches (15 cm.) long is then constructed by a side-to-side anastomosis. I have used a single row of sutures through and through for the inner row and Connell stitches for the outer row. Linen is used as the suture material. The abdomen is then closed and the animal placed in the lithotomy position. The mobilized bowel is exteriorized by traction with Babcock intestinal forceps; the colon is transected close to the anus, and the ileum is sutured to the rectal stump with two rows of stitches—an interrupted row from serosa to serosa and a continuous row to include all the layers. This is after the manner of the Weir-Swenson technic. In man, since the ileum is easier to mobilize, all of the rectal mucosa could be excised, a "rectal shelf" and an intact sphincter mechanism being left.

In this series I operated on 7 dogs. My greatest difficulty was in mobilization of the ileum; this is limited by the vascular

Results of Experimental Operations

Dog	*Date*	*Comment and Results*
1	1/8/55	Too much bleeding at operation. Dog died on 14th postoperative day. Autopsy: complete absence of healing
2	1/17/55	Died of hypopotassemia on 13th postoperative day. Stools turned from liquid to mushy by 5th day. Swelling of scrotum totally disappeared before death. Autopsy: complete healing, good-sized pouch
3	2/7/55	Died of peritonitis from leakage at ileoanal anastomosis on 3d postoperative day
4	3/8/55	Same course as Dog 3
5	3/28/55	Survived. Preoperative weight, 30 pounds; weight 1½ weeks after operation, 28 pounds; weight on April 27, 30 pounds; on May 11, 31 pounds. Stools liquid to mushy 5 days after operation. At time of writing, 3-4 stools daily, mushy. Roentgenogram taken April 18 showed good-sized pouch; on April 19, barium totally expelled. Regular diet since 1st postoperative day
6	4/12/55	Survived. Preoperative weight, 29 pounds; weight 1½ weeks after operation, 27½ pounds; on April 11, 29 pounds. Edema of perianal region, with complete recovery by 12th day. At time of writing 4-5 mushy stools daily
7	5/9/55	Died of peritonitis on April 12, owing to leakage at ileoanal anastomosis. Good-sized pouch, triple lumen

arcades, which are composed of very short vessels. As will be seen in the table of results, most of the deaths occurred from leakage at the ileoanal anastomosis. Dog 2 died of chemical imbalance on the thirteenth postoperative day. In this instance the pouch was oriented cephalad and had attained a large size as compared to the ileum. In Dog 7 a three-loop pouch had been constructed. This animal died on the third postoperative day from leakage at the ileoanal anastomosis. Dog 1 died of anemia because of loss of blood at operation. Dogs 3 and 4 died of leakage at the ileoanal anastomosis. Dog 5, a bitch, is still alive at the time of writing, almost six months after the operation. Her condition is highly satisfactory—in fact, she has had a litter of puppies. At the time of the first report, this dog was passing three or four mushy stools daily. The only reaction to the operation, except for the looseness of the stools, was edema of the perianal region, which subsided by the thirteenth postoperative day. The dog's weight, from 30 pounds (13.6 Kg.) at the time of operation, dropped to 28 pounds (12.7 Kg.) one and one-half weeks after the operation, and forty-four days after the operation she had gained 1 pound (0.5 Kg.) over her original weight. At the time of writing her weight is 29½ pounds (13.4 Kg.). Roentgenograms were taken, after a barium enema, on the twenty-first postoperative day, which showed a good-sized pouch; a flat plate taken a day later showed complete evacuation of the barium.

Dog 6 followed a similar course. This animal was operated on four months prior to the time of writing. Its weight at the time of operation was 29 pounds (13.2 Kg.), which dropped to 27½ pounds (12.4 Kg.) one and a half weeks later. In a month the dog had recovered its original weight and at the time of writing weighs 31 pounds (14.1 Kg.). Edema of the perianal region developed but subsided by the twelfth postoperative day. The stools turned mushy by the fifth day. One month later the animal was passing an average of four or five stools per day. At the time of writing there are two stools daily, one at night and the other after feeding in the morning. Frequently the stools are formed.

This technic is intended for cases in which total colectomy is required, e.g., cases of ulcerative colitis or multiple polyposis. It should prove more effective in man than in animals, since human beings can hold back the urge to defecate. Since there is a storage place for the fecal contents, the number of daily movements can be decreased to a point at which irritation to the anal and perianal skin is avoided and loss of fluids and electrolytes controlled by adequate absorption of these elements from the small bowel.

SUMMARY

This article deals with a pull-through (of the ileum through the anus) procedure, with preservation of an intact sphincter mechanism and a side-to-side ileo-ileostomy, the purpose of which is to establish a pouch to serve as a reservoir for ileal contents. The technic is described in detail, as performed experimentally on dogs. In the author's opinion it should prove even more effective in man.

SUMARIO

Este artigo trata de um método "pull-through" (do íleo através do ânus), com preservação do mecanismo de um esfincter intato e de uma íelo-ileostomia látero-lateral, cujo propósito é estabelecer uma bolsa para servir de reservatório para o conteúdo do íleo. O autor descreve essa técnica em detalhe, conforme foi experimentalmente executada em cães. Na sua opinião, ela deve ser ainda mais eficaz no homen.

RÉSUMÉ

Cet article est consacré à une technique de préservation du mécanisme sphinctérien par iléo-iléostomie bord à bord, dont le but est d'établir une poche servant de réservoir au contenu de l'iléus. Cette technique est décrite dans tous ses détails, telle qu'elle a été appliquée expérimentalement sur des chiens. L'auteur pense qu'elle devrait se révéler plus efficace encore chez l'homme.

ZUSAMMENFASSUNG

Die Arbeit beschreibt ein Operationsverfahren, bei dem das Ileum durch den After hindurchgezogen wird unter Erhaltung des Sphinktermechanismus und in Verbindung mit einer Seite zu Seite angelegten Ileoileostomose, deren Aufgabe in der Schaffung einer als Reservoir für den Dünndarminhalt dienenden Tasche besteht. Die am Hundeexperiment angewandte Technik wird in ihren Einzelheiten beschrieben. Der Verfasser glaubt, dass der Eingriff sich am Menschen von noch grösserer Wirksamkeit erweisen sollte.

RIASSUNTO

In questo articolo ci sioccupa dell'abbassamento dell'ileo attraverso l'ano con conservazione dello sfintere e dell'ileo-ileostomia latero laterale con lo scopo di creare un serbatoio per il contenuto ileale. La tecnica è stata descritta nei suoi dettagli, così come è stata sperimentalmente eseguita nei cani. Secondo l'ideatore essa dovrebbe essere anche più efficace nell'uomo.

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A Case of Gastric Volvulus in a Child

C A PROANO C, M D

LIMA, PERU

ACCORDING to Bockus, it was Berti in 1866 who confirmed the diagnosis in the first case of torsion of the stomach, during autopsy of a woman 60 years old, but the first cases in which operation was performed with success were those reported by Berg in 1895 and 1896 This period is considered by some authors the beginning of the "surgical period proper"

Gastric volvulus has been considered, with much reason, one of the rarest surgical pathologic entities, therefore, it is small wonder that so renowned a French author as Mondor has said that in the French medical literature it was only after the appearance of the work of Tuffier, Jean and Lenormant that the French textbooks began to mention this rare condition, and that Lecene and Leriche, in the 1926 edition of their classic book *Surgical Pathology*, mentioned only 30 cases One of the most modern and most comprehensive studies was written by Anagnostidis in 1936, this author had collected 116 cases, but in 1943 he increased this figure to 146 One of the most recent papers on this subject (by Daalgard) appeared in *Acta Chirurgica Scandinavia* in 1952

The former citations are related especially to gastric volvulus in the adult The condition is still rarer in children, although in recent years it has been reported frequently as occurring in infants Since Marie and his co-workers read their paper before the Societe Francaise de Pediatrie in 1948, however, there is more discussion of plication for volvulus in infants Dujon (1910) is perhaps the first who described the case of a 5 year-old child, operated on because of acute gastric symptoms at whose autopsy a mesenteric axial volvulus was revealed

The rare occurrence of volvulus in children is evident if one remembers that, of the 116 patients of Anagostidis only 6 3 per cent were children between 1 and 10 years of age Experience at the surgical service in the Hospital del Nino does not disagree with the foregoing statistics, in the decade from 1944 to 1953, with 5,586 hospital admissions, only 1 such case has been encountered The patient was a child 3 years old, whose case will be reported in this paper It is the only such case to be observed during the twenty-five year history of the hospital

Some authors have stated that it is not possible to establish the characteristics of each case at operation Others have affirmed that it is possible to diagnose the condition only on the autopsy table In my opinion the classic anatomic classifications retain their value Their supporters, as is well known, consider two essential forms, organic and axial, the latter of which is less frequent than the former in all statistics published I recognize also the mixed forms, in which there is some predominance of one of the axes of torsion

Among the clinical classifications, the best, I am convinced, is that of Ancilotti

Furthermore, volvulus is a condition most commonly observed in the adult, especially, according to Bonorino Udaondo, between the ages of 40 and 60 years It was assumed until recently that the youngest patient on record was a 3-month old baby described by Pozzan, whose volvulus was of the mesenteric-axial variety If one

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recalls the reports of Marie and his associates, Roviralta and Doberti and others of South America, it is apparent that the number of cases of volvulus or plication in infants has increased, and it is possible that future statistics will vary in comparison with the one now available.

Conventionally, as a criterion of total volvulus, 180 degrees of torsion has been suggested, the volvulus being considered partial when it does not reach this point. It is true that torsion in the total volvulus is nearly 180 degrees and that cases are rare in which torsion has surmounted this figure. Nevertheless, one must not forget the exceptional case of Niosi, in which the torsion reached 400 degrees. The mechanism of the mesenteric-axial volvulus is more complicated than that of the organo-axial variety, which is the most commonly encountered. In the former, since the pylorus is the most freely movable portion of the stomach, it rotates in front and to the left, finishing in a position above the cardia. In the latter the torsion takes place around an axis that unites the two orifices. Generally the torsion of the greater curvature drags the colon upward, so that the posterior surface becomes the anterior (the so-called anterior variety); sometimes the torsion is reversed (posterior variety).

A partial volvulus, then, is one in which the torsion does not reach 180 degrees and which appears intermittently in relation to gastric or perigastric lesions.

There have been cases in which an ectopic spleen, adhesions or supernumerary or anomalous vessels have contributed to the production of gastric volvulus. It has been stated in more than one instance that volvulus is produced exclusively by an ectopic spleen or by adhesions, and some authors, such as Niosi, have affirmed that, in every case of acute disease of the upper part of the abdomen in which there is an ectopic spleen, there is the possibility of a volvulus.

This opinion was shared by Muchi and Pellegrini, who stated that, in cases of acute abdominal disease in which roentgen study reveals the splenic space to be empty, one should consider a gastric volvulus.

As a consequence of the torsion of total volvulus, there is occlusion of both orifices of the stomach, especially of the cardia, beginning with torsion of the pylorus (the most freely movable segment). Complete blockade, however, does not occur in every instance, since some authors, such as Gottet, have affirmed the lack of blockades even with 200 degrees. In the case here to be reported, I consider the volvulus total and of the mesenteric-axial variety. Even though the classic symptoms were present, complete cardiac blockade did not occur; it was possible to pass a probe easily into the stomach.

With regard to the etiopathogenic factors in the production of volvulus, I agree with the authors who have postulated two types of etiopathogenesis: predisposed and liberative (Bockus). Among the former, it is necessary to mention the following factors:

1. Gastric ptosis, with consequent dilatation and looseness of the supporting elements. The last-mentioned sign is said to be essential, since in its absence it is difficult to present the nosologic picture here reported.

2. Congenital acquired alterations of diaphragm, such as hernia or eventration, almost always localized in the left hemidiaphragm. These conditions predispose to total or partial acute gastric volvulus, and if there are "liberation factors," such as adhesions or gastrocolic meteorism, it is easy to understand that volvulus may occur. Reportedly, some eventrations have been so high that the left hemidiaphragm was observed in the first intercostal space. The phrenic atony of Loeger, as well as

Classification of Gastric Volvulus

Gastric volvulus	Acute volvulus	Total	
		Partial	
	Chronic volvulus	Total (rare)	Primitive or secondary to other intrinsic or extrinsic lesions
		Partial	Secondary to gastric or extragastric lesions
	Intermittent volvulus		

paretic or paralytic conditions of the hemidiaphragm, may produce total or partial volvulus. In the case to be reported I have confirmed this predisposing factor, clearly noticeable during repeated roentgen studies in which I allowed the hemidiaphragm to remain fixed at the height of the seventh intercostal space. It is possible to see in a roentgen plate, some days after surgical reduction of the volvulus, that the colon, noticeably attached to the antral portion, has a tendency in its splenic angle to fill the great space left by the diaphragmatic paralysis. Another predisposing factor in this group of diaphragmatic alterations is phrenicectomy (Breitkoff).

3. Gastric biloculation, or hourglass stomach, congenital or existing as the consequence of a previous ulcer. This has been mentioned as a factor since the time of Kocher. Usually it is congenital, but I cannot remember mention of it in the reported cases of volvulus in children.

4. Peptic ulcer. This has always been emphasized as a predisposing factor—so much so that Boppe reported its presence in 15 of 44 cases.

5. Tumor. A tumor of any histologic type can also be a predisposing factor but is not frequently encountered. The example usually cited is the case of Van Haborer, in which a carcinoma was the cause of a volvulus that required gastric resection.

6. Perigastritis. This condition also has been blamed as capable of producing partial or total volvulus. In children perigastritic adhesions are not often observed, though in the youngest there is a tendency toward partial or incomplete volvulus. Weiss and his co-workers, however, in 1952 reported the case of a baby 12 days old with an organo-axial volvulus due to congenital bands between the greater curvature and the inferior surface of the liver. In my case, in addition to phrenotony of the left hemidiaphragm, the perigastritis that attached the pyloric and antral portion of the stomach to the right colic angle may have been another predisposing factor.

7. Ectopy of the spleen.

8. Aerocolia. This is an important factor, as has been suspected for a long time. A stomach filled with gas or, more frequently, a gas-distended colon may contribute to the production of volvulus, especially in the plications of the infant, where it appears to be a conclusive factor. It should not be forgotten that in some adults and especially in the you st c en there is a tendency tow

eous intestinal distention in the left side of the transverse portion of the colon.

9. Pregnancy. This has been mentioned, although rarely.

In spite of all previous considerations, there is a good percentage of cases in which the predisposing factor cannot be identified even at the autopsy table. These are cases of the so-called idiopathic volvulus, quite numerous in former statistics (Anagnostidis, 44.7 per cent), but perhaps less frequently recorded in later studies.

Among the "liberative" causes are as follows: 1. Acute dilatation of the stomach, which, if not due to previous surgical or infectious causes, is very difficult to diagnose. 2. Stress. 3. A copious meal (as in the case to be reported), after which the symptoms become more acute, especially if the meal has included a large quantity of delicacies. 4. Trauma. 5. The intractable vomiting of pregnancy (this form of causation is rare).

Surely the clinical picture of acute total volvulus is one of the most dramatic in the surgical field, and so serious that, if not treated properly in time, it can cause death. Almost always the onset is associated with vomiting, in most cases of short duration. At first the vomitus contains food and afterward mucus, but never bile, blood or putrid matter. Then comes the intense colicky pains localized to the epigastrium. These pains may be constant or intermittent and may spread to both the hypochondrium and the dorsum. Rapidly the picture becomes established, with the classic triad outlined a long time ago by Borchardt:

1. Symptoms of ileus, with unproductive efforts at vomiting.
2. Meteorism localized in the epigastrium and the left hypochondrium.
3. Insuperable resistance to the insertion of a probe into the stomach.

My little patient presented almost all of this symptom complex except obstruction of the cardia. Since I did not take into account the possibility of gastric volvulus, I was inclined to think of ileus of the colon or of the highest portion of the small intestine. I even thought of clinical entities involving the duodenum and its vicinity that might block the passage of food, since the clinical picture was that of ileus with nausea but without vomiting.

The meteorism, although localized in the epigastrium and the left hypochondrium, presented two lobulations, the tumor being divided in its inferior portion. The tumor in this case differed from the type described by other authors, who have stated that it should exist in two segments, one superior-vertical and the other inferior-horizontal.

With regard to the impossibility of inserting a probe into the stomach and the dysphagia always mentioned, I must state that in my case a Nelaton No. 18 probe passed the cardia. This confirms the statement of Udaondo. And, despite the assertion that in a case of total volvulus there is dysphagia for solid food first and then for liquid (Berg), my patient could ingest small amounts of the latter.

It is said that peristalsis is present in cases of partial volvulus, but in my case, despite the fact that the volvulus was total, it was present. Before the emptying of the stomach the peristaltic waves were scarcely perceptible as shallow undulations that began in the right hypochondrium and proceeded to the epigastrium, but after the emptying of a good portion of the gastric contents they became more manifest.

The general state of the patient is severely involved a short time after the clinical manifestations begin; he appears seriously ill, with a "peritoneal facies." Distention of the stomach leads not only to dextrocardia but to true states of asystole that can produce death. In my case the general aspect of the patient was serious;

the "peritoneal facies" was present, with clinical signs of obvious shock and unconsciousness, though occasionally he became conscious and complained of severe pain, especially in the epigastrium, which produced unproductive retching. Intermittent volvulus occurs most frequently in adults with anatomic lesions, but in many instances it is not possible to discover the true cause. The clinical picture is that of a painful crisis, generally accompanied by vomiting, which, according to Jean, may last for hours or months. Sometimes the pain is so severe that it is confused with renal or biliary colic; the general condition of the patient, however, is not bad, doubtless owing to the fact that intermittent volvulus is usually of the partial type. It is not often observed in children, especially in infants, because in infancy the lesions of perigastritis are not infrequent. Nevertheless, one must always think of this possibility; it occurred in the case reported by Weiss and his associates.

Both the volvulus of infancy and plications of the stomach are clinical entities that take on more importance with time. With a patient who vomits habitually one must keep it in mind, in order to study systematically, with the roentgen ray, the vomiting infant who is resistant to the medical-dietetic treatment usually employed. Actually only cases of the organoaxial type of volvulus, total or partial, have been mentioned. With the latter, roentgen examination is especially important, since the plications resemble other clinical entities common in infancy. The vomitus does not contain bile or blood; the entity is not present immediately after birth and therefore may simulate the "free interval" of a patient with pyloric stenosis. No doubt, as Roviralta suggested, more than one of these patients has been subjected to pyloroplasty.

Moreover, because of the laxity of the supporting elements in the infant, a great deal of emphasis is placed on the etiopathogenic influence of aerocolia and even the phrenic atony of Loeger. If the aerocolia is more marked in the hepatic angle of the colon the plication will be partial; if it is more marked in the splenic angle it is more likely to be total. Because of their intermittent character, the plications will produce transient roentgenographic changes and clinical manifestations. And, of course, the treatment in the majority of cases should be exclusively conservative, including simple postprandial postural treatment with the patient in the prone decubitus and the light Trendelenburg positions.

Not always has the roentgen diagnosis been made during the acute phase, although in my case it was. In cases of acute abdominal diseases, when I consider it necessary, I do not hesitate to perform roentgen examination with the roentgenologist in attendance. The roentgen pictures of the two varieties of volvulus are

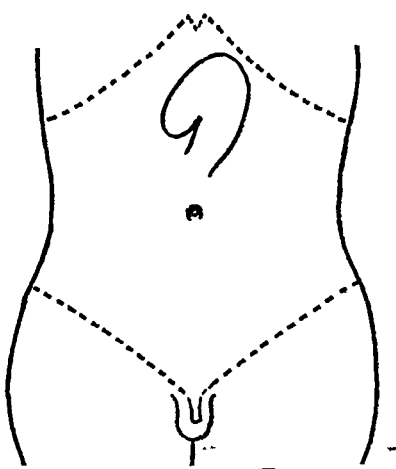

Fig. 1.—Diagrammatic

entirely different. Of the organo-axial variety it has been said with much reason that marked distention of the colon prevails, especially of the splenic angle, that pushes the stomach upward. When barium is administered to an infant, one should begin with very small doses. In this way it can be observed, first, that there exists a gastric compartment more or less dilated; and then that the barium goes horizontally to the right, arriving at the pylorus and producing a biloculated shadow. The greater curvature follows the same course as does the opaque substance, accentuating the displacement caused by total volvulus. The greater curvature, therefore, remains in the upper part of the liver. The aspect of the stomach as a whole gives the impression of a kidney turned downward. Many authors compare this picture with that of the penis, calling it "obscene stomach."

With the mesenteric-axial variety of volvulus the superior gastric compartment is larger than that with the organo-axial type, which can be observed in a flat plate of the abdomen. Such was the case with my patient, because the superior gastric compartment was so distended that I even thought of duodenal obstruction due to a band or other element that prevented the passage of food to the duodenum. This upper compartment, filled with opaque substance, was directed and pushed above the cardia, resembling a resected stomach. The pylorus, of course, was directed to the left and was filled with difficulty, with occasional peristaltic movements from right to left. It is customary in these cases also to place the patient in the prone decubitus position, so as to observe that the caudal gastric and antral portions turn above and behind the gastric fundus.

In general agreement with the statement that an ectopic spleen favors gastric volvulus, a free splenic fossa can be observed roentgenographically, a sign that suggests the presence of volvulus (Muchi-Pellegrini).

It is well known that the clinical diagnosis is difficult. In the case of a vomiting infant the possibilities of error are numerous. According to Weiss and his co-workers, one must consider the following diagnoses:

1. Pyloric obstruction
2. Intussusception
3. Malrotation of the midgut
4. Atresia of the esophagus
5. Anomalous vessels in the form of vascular rings that go from the aorta to the esophagus
6. Duplication of any segment of the digestic tract
7. Meconial ileus
8. Congenital obstruction of the anus and rectum
9. Pancreatic rings
10. Intrinsic malformation, such as atresia or stenosis
11. Gastric torsion due to congenital bands.

At the age just beyond infancy the diagnostic difficulties are evident. In my case I thought first of the possibility of ileus of the colon and especially sigmoidal volvulus. I thought also of acute dilatation of the stomach, despite the rarity of this condition in both children and adults except in the presence of special surgical conditions. Also, I thought of a duodenum acutely blocked by a band or other congenital malformation. I must emphasize, however, the fact that, even with the effective aid of the roentgen ray, my thought was inclined in the direction of volvulus of the bowel.

Gastric volvulus, owing to its seriousness, must be treated surgically without delay, and it has been said that in the face of the slightest suspicion one is obligated to operate. Action is necessary even in those cases in which it has been possible to pass a probe through the cardia for par-

tial emptying of the gastric contents. I was easily able to remove 600 cc. of a "cafe au lait" liquid substance with an acid smell. This previous emptying of the stomach resolved the condition only partially, but doubtless it was the reason the volvulus was almost totally reduced. It has been mentioned that within the abdomen one may observe a chylous liquid (as in 1 of Kocher's patients, operated on during digestion); bloody liquid, or even pure blood (as in Borchard's patient with a laceration of the spleen).

The tumor that appears immediately after the opening of the abdomen has been wisely called "stomach cyst." It is immensely distended, giving the impression that it fills the whole abdominal cavity. It can be confused with torsion of an ovarian cyst or with volvulus of the sigmoid flexure of the colon; one can orientate oneself by its conformation, its firmness and the distribution of the vessels. In the special instance of volvulus of the sigmoid, however, it must be remembered that the superior portion is free, as it is not in the presence of volvulus.

In rotation maneuvers employed to evacuate the stomach by natural means or by a single puncture with a thick trocar, the usual well-known precautions must be observed. This evacuation is absolutely necessary when the distortion is impossible to handle otherwise. With the stomach partially or totally emptied one can identify the type of volvulus, but in some cases, if emptying is not complete, this is still difficult. With the organo-axial variety, total or partial, the posterior face becomes the anterior and covered by the epiploön, while the transverse portion of the colon is partially or totally directed upward above the greater curvature; the contrary is seen when the volvulus is a posterior type. With the mesenteric variety, in which the gastric cyst may also be large, once the distortion has been partially or totally realized, it can be noted that only one part of the transverse portion of the colon is present, since the left portion disappears completely behind the stomach. This was observed in my case.

After reduction of the volvulus, the intrinsic or extrinsic lesions that produce the clinical picture can be appreciated and corrected if necessary. In the majority of cases, however, the less that is done the better. This opinion is justified by the severity of the situation.

Some authors accept a gastropexy; in the past, gastroenteroanastomosis and even gastric resection were recommended.

The prognosis is correlated with the interval from the onset of symptoms to the moment at which the patient undergoes operation—and, of course, with the quality and duration of the intervention. The results are most successful when the operation is limited to a single reduction.

REPORT OF CASE

C. V., a white boy 3 years and 2 months old, was admitted to the hospital with a definite diagnosis of gastric volvulus.

The family and personal data were unimportant with regard to the present illness. According to the father, the patient had been in apparent good health until fifteen days before admission, when he began to feel slight pains in the abdomen after taking food. The pain was not particularly annoying and was not accompanied with dyspeptic symptoms. The feces were normal. On the day before admission he became nauseated, vomited, and had intermittent abdominal pains. When admitted to the hospital the child was in severe pain similar to colic, but there was no vomiting. On the previous day he had been given an enema, and on admission, fourteen hours after the enema, the abdomen was severely distended.

On the day before the beginning of his complaints he had eaten many sweets at a family party.

The patient was hospitalized because of the symptoms of an acute abdominal syndrome with signs of intestinal obstruction.

Physical Examination. — The patient was severely ill, with the peritoneal facies; he was in an evident state of shock and complained constantly. The nutritional state was well preserved. The skin was pale and extremely cold. The pulse was feeble and frequent.

The abdomen was swollen at the level of the epigastrium and the left hypochondrium, with a depression giving the tumorous mass a biloculated appearance: the inferior segment included not only the epigastrium but the supraumbilical region. There was flattening of the flanks, the hypogastrium and both iliac fossae. Occasionally there were peristaltic waves beginning at the right and going to the left, coinciding with the moments in which the pains were accentuated.

The tumor was almost hard. Its shape as judged by palpation was the same as that observed during simple inspection. Percussion of the tumor evoked hardly any pain, but there was tympanism in the portion most prominent and dullness in the inferior portion.

After roentgenoscopic examination I took two flat plates of the abdomen. Considering the patient's severely ill state and the extreme distention of the stomach, I decided to drain the gastric contents with a Levine tube. The tube passed without difficulty, and it was possible to remove 600 cc. of acid-smelling "cafe au lait" liquid.

Immediately afterward the tumor disappeared, improving noticeably the anguished state of the patient. Later it was noticed that gastric peristaltic waves increased on finger percussion. During the fourth day of hospitalization the patient was treated with the therapeutic measures commonly used in these circumstances, as well as permanent gastric drainage. On the following day his general state was better, but the temperature was 38 C. (100.4 F.). Gastric lavage was done before the patient was sent to the roentgen laboratory.

On the day before the operation the general state was good. The boy was afebrile; the abdomen was flat; the peristaltic waves had disappeared, and bowel movements were absent. Gastric suction was maintained, although the patient was allowed small quantities of dextrose solution.

On the day of the operation the patient was in still better condition, but the small quantities of gastric contents of the same "cafe au lait" color were still present. The postoperative course was good, although the wound did not heal *per primam* because of infection of the planes. Also, in the middle of the postoperative period, the patient presented the rash of varicela.

Roentgen Data (Day of Admission, Nov. 9, 1953).—A flat plate taken with the patient in the decubitus position (Fig. 2 *A*) showed a great gaseous accumulation, sharply outlined and egg-shaped, extending vertically from the eleventh dorsal to the first sacral level and horizontally from the eleventh dorsal to the first sacral level and horizontally from one lateral wall to the other.

A flat plate taken with the patient standing (Fig. 2 *B*) showed a large amount of air and liquid in the left side of the abdomen; the liquid level extended from the inferior portion of the epigastrium to the second lumbar disc. The area filled with gas ascended in the left hypochondrium to 1 fingerbreadth below the corresponding hemidiaphragm; the latter was in a high position, reaching the seventh intercostal space and pushing the heart to the right.

This roentgenographic picture was reported as corresponding to acute gastric dilatation with hydro-aerial stasis, due to high intestinal obstruction (probably in the duodenum) and diaphragmatic eventration.

On November 10, twenty-four hours after 600 cc. of gastric contents had been removed, roentgen examination showed the same characteristics in the two hemidiaphragms.

Frontal flat plates taken with the patient standing and in the lateral position (Fig. 2, *C* and *D*) revealed, in addition to the same characteristics of the two hemidiaphragms, a large hydro-aerial area, its liquid level at the eleventh posterior rib arc. The stomach was inverted, with the cardia at the level of the pedicle or the second lumbar vertebra, and the fornix of the left flank and the upper portion of the left iliac fossa. The vertical segment was in the flank and the inferior portion of the left hypochondrium; the transverse segment, the pyloric antrum and the pylorus were also in the left hypochondrium.

Roentgenograms with an opaque medium were taken with the patient in the frontal standing (Fig. 2, *E* and *F*), the frontal decubitus prone (Fig. *G*), the left lateral decubitus (Fig. 2 *G*) and the frontal lateral supine (Fig. 2 *H*) positions. In the last-mentioned plate it was possible to visualize the aforementioned gastric dilatation, as well as the lengthening and thinness of the first 6 cm. of the duodenal portion. All these plates were taken an hour and a half after ingestion of the barium, when 90 per cent of the opaque substance remained

Fig 2.—*A*, flat plate taken with patient in decubitus position *B*, flat plate taken with patient in standing position *C*, flat plate taken with patient in frontal standing position after partial evacuation *D*, flat plate taken with patient in lateral position after partial evacuation *E*, *F*, *G* and *H*, films taken after use of an opaque medium with patient in various positions, *E*, frontal standing, *F*, frontal decubitus prone, *G*, left lateral decubitus, *H*, frontal decubitus *I*, appearance of colon in the presence of the opaque medium

within the stomach, with the remainder in the jejunum Three hours afterward 80 per cent of the barium was still in the stomach

These plates were reported as showing gastric volvulus of the mesenteric-axial variety, conditioned by congenital malf

left hemidiaphragm and possibly the first portion of the duodenum, which was lengthened, decreased in caliber and extrinsically compressed by the dilated fornix. The duodenum also crossed the cardia. All these signs localized the obstruction to the first part of the duodenum.

Roentgenograms taken with the patient in the frontal standing position and the left anterior oblique position (Fig. 2 *I*) six days after the first examination showed that the volvulus had been reduced.

In November 26, roentgen examination of the colon with an opaque medium showed normal motility and a normal appearance; the plenic angle was doubled over itself and occupied the left hemidiaphragm.

Operation (November 12).—A paramedian incision 12 cm. long was made, beginning in the vicinity of the xiphoid process and extending to a point 2 cm. below the umbilicus. When the peritoneum was opened it was observed that the stomach was dilated. The greater curvature presented anteriorly, and part of its posterior surface was covered with the epiploön. The exploration began with the left side, where there were some adhesions between the stomach and the spleen. Since the adhesions were vascularized, they were not divided. Behind the stomach was a good portion of the transverse colon and the splenic angle of the colon, which were removed by gentle traction.

On the right side there were many slight adhesions, between the gallbladder and the inferior surface of the liver and the stomach. These adhesions were freed almost entirely, and it was observed that the stomach and the colon were adherent. Immediately after the latter adhesions were divided, peristaltic waves appeared and increased with digital pressure.

SUMMARY

A case of acute mesenteric-axial volvulus of the stomach in a child 3 years old is reported. The diagnosis was made exclusively by roentgenographic means, through the combined efforts of the roentgenologist and the clinician. This was the first such case observed in ten years and the first of its kind to be observed in the twenty-five year history of the Hospital del Nino in Lima.

Simple flat plates of the abdomen were taken with the child standing up and in the dorsal decubitus position. These revealed unusual dilatation of the stomach, suggesting blockage of the duodenum above the ampulla of Vater.

The vomit contained no bile.

In the author's opinion the mesenteric-axial volvulus in this case was the result of aerocolia of the transverse portion of the colon, which, being in close relation to the antral portion of the stomach, probably produced the volvulus. Atony of the left hemidiaphragm, which was unquestionably present, may have aided in the causation.

Although the child's condition had improved as a result of the first evacuation of the stomach, an operation was performed on the basis of the roentgen evidence. Obviously the evacuation had not been complete, since only small portions of the gastric contents were obtained by continuous drainage. During the operation it was noted that the volvulus was almost completely reduced, and its reduction was completed by traction on the transverse portion of the colon, which lay behind the stomach and below the left hemidiaphragm. Adhesions between the right angle of the colon and the antral portion of the stomach, which were considered an important etiologic factor, were sectioned.

RÉSUMÉ ET CONCLUSIONS

Nous présentons un cas de volvulus total mesenterico-axial de l'estomac chez un enfant agé de 3 ans. Le diagnostic fut fait exclusivement radiologic et c'était tres éloquent parce que les investigaciones futent faits avec l'aide du radiologue. C'est l'unique cas qui ait été décrit en 25 ans de vie de notre Hopital. De lá que nous avons cru intéressante sa publication.

Avec des plaques radiologiques simples en position débout et en décubitus dorsal il fut possible visualiser une image inu-

sitée de dilatation gastrique qui nous avait fait penser dans un blockage aigu du duodenum au dessus de l'ampoule de Vater du moment que les vomissements ne contenait pas de bile.

Nous croyons que le volvulus fut originé par une aerocolie du colon transverse qui était en relation étroite avec la portion antrale et le corps de l'estomac et qui conduisit à cer órgane à la formation d'un volvulus de la varieté mesenterico-axial. Cette situation a été aussi favorisé par une atonie de l'hemidiaphragme gauche.

Nous sommes intervenus en vue du resultat de l'examen radiologique et malgré l'amelioration rémarquable observée chez le patient obtenue avec une premiére extraction du conètenu gastrique, le drenage continu faisait couler des petites quantités de liquide gastrique de couleur café au lait et d'oreur trés acide. Pendant l'intervention nous observons qu'en vue de l'évacuation partielle du contenu gastrique le volvulus était presque aussi totalment réduit et nous fumes obligé a finir la reduction avec une traction légere du colon transverse, situé derriére l'estomac et qui continué à occuper profondement l'hipocochondre gauche au voisinage de l'hemidiaphragme paresié de ce coté là. Aussi nous avons pas oublié de sectioner les adherences qui unissaint l'angle droit du colon avec la portion antrale de l'estomac auxquelles nous attribuons un role trés importante.

RESUMEN

Presentamos un caso de vólvulos mesentérico-axial, agudo i total, en un niño de 3 años de edad. El diagnóstico fué exclusivamente radiológico, siendo las investigaciones hechas en compañía del radiólogo. Nos ha parecido interesante su publicación por ser el único caso en los 25 años que tiene de fundado nuestro hospital.

Con placas simples del abdomen en posición de pie i decúbito dorsal, se pudo comprobar una inusitada dilatación del estómago que hacía pensar en un bloqueo agudo del duodeno, por encima de la ampolla de Vater, ya que los vómitos no contenían bilis.

Nos parece que el vólvulos se debió posiblemente a una aerocolia del colon transverso, el cual al estar enestrecha relación con las porciones antral i del cuerpo del estoómago, llevaron a éste a constituir un vólvulos de la variedad mesentérico-axial, situación que estuvo favorecida además, por la evidente frenoatonía del hemifiafragma izquierdo.

Fuimos al acto operatorio en vista de del diagnóstico radiológico i a pesar de que las condiciones generales del paciente habían mejorado de manera notable con la primera extracción del contenido gástrico. Sin embargo, todavía se siguió extrayendo mediante drenaje contínuo pequeñas cantidad de contenido gástrico de color café con leche i olor ácido. Durante la operación pudimos comprobar que a consecuencia del drenaje gástrico, el vólvulos casi se había reducido por completo i sólo nos vimos obligados a terminar la reducción de él mediante la tracción suave del transverso, que escondiéndose detrás del estómago, iba a colocarse profundamente en el hipocondrio izquierdo por debajo del hemidiafragma parético de ese lado. Así mismo, no dejamos de seccionar las adherencias que unían el ángulo derecho del colon con la porción antral del estómago, i a las que atribuímos papel etiológico importante.

ZUSAMMENFASSUNG

Es wird über einen Fall von akutem Magenvolvulus um die Achse des Mesenteriums bei einem dreijährigen Kinde berichtet. Die Diagnose wurde durch die vereinten Bemühungen des Röntgenologen und des Klinikers ausschliesslich auf Grund der Röntgenbefunde gestellt. Dieser

Fall war der erste, der in den letzten zehn Jahren beobachtet wurde, und der erste, der in der 25 jährigen Geschichte des Hospital del Nino in Lima vorkam.

Einfache Übersichtsaufnahmen des Bauches wurden bei aufrechter Stellung und in Rückenlage des Kindes vorgenommen. Sie ergaben eine ungewöhnliche Magenerweiterung, die auf einen Verschluss des Zwölffingerdarms oberhalb der Vaterschen Ampulle schliessen liess. Im Erbrochenen fand sich keine Galle.

Der Verfasser glaubt, dass im vorliegenden Falle die Verschlingung des Magens um die Achse des Mesenteriums durch Blähung des in enger Beziehung zum antralen Abschnitt des Magens stehenden Querdarms hervorgerufen wurde. Eine zweifellos vorhandene Atonie der linken Zwerchfellkuppe mag zur Entstehung des Volvulus beigetragen haben.

Obgleich der Zustand des Kindes sich als Folge der ersten Entleerung des Magens gebessert hatte, wurde im Hinblick auf den Röntgenbefund eine Operation vorgenommen.

Da durch fortgesetzte Drainierung geringe Mengen von Mageninhalt erhältlich waren, musste man annehmen, dass die Entleerung un vollständig war. Während der Operation stellte sich heraus, dass die Magenverschlingung fast völlig reduziert war. Eine totale Wiederherstellung normaler Verhältnisse wurde durch Zug am transversalen Abschnitt des Dickdarms, der hinter dem Magen und unterhalb der schlaffen linken Zwerchfellkuppel lag, erzielt. Verwachsungen zwischen der rechten Flexur des Dickdarms und dem antralen Magenabschnitt, die als ein untergeordneter ursächlicher Faktor angesehen wurden, wurden gelöst.

SUMARIO

Um caso de vólvulo mesentérico axial agudo do estômago em uma criança de 3 anos é relatado. O diagnóstico foi feito exclusivamente por meios roentgenográficos, através dos esforços combinados do roentgenologista e do clínico. Este foi o primeiro de tais casos observado em 10 anos e o primeiro de sua espécie a ser observado no Hopital del Niño em Lima, durante um período de 25 anos.

Radiografias simples do abdómen foram tiradas com a criança em pé e na posição de decúbito dorsal. Elas revelaram uma dilatação pouco frequente do estômago, sugerindo bloqueio do duodeno acima da ampola de Vater. O vômito não continha bile.

Na opinião do autor o vólvulo mesentérico axial nestecaso era o resultado de aerocolia da porção transversa do colo, que, estando em relação intima com a porção antral do corpo do estômago, provàvelmente produziu o vólvulo. A atonia do hemidiafragma esquerdo, que inquestionàvelmente estava presente, pode ter auxiliado a causa.

Embora a condição da criança tivesse melhorado após o primeiro esvaziamento do estômago, procedeu-se à operação pela evidência radiológica. É óbvio que o esvaziamento não fôra completo, uma vez que se obtiveram apenas pequenas porções do conteúdo gástrico pela drenagem contínua. Durante a operação notou-se que o vólvulo estava quase completamente reduzido e sua redução foi completada por tração na porção transversa do colo, que se encontrava atrás do estômago e abaixo do hemidiafragma esquerdo atônico. As aderências entre o ângulo direito do colo e a porção antral do estômago, que foram consideradas um fator etiológico importante, foram seccionadas.

RIASSUNTO

Viene riferito un caso di volvolo acuto dello stomaco in un bambino di 3 anni. La diagnosi fu fatta esclusivamente con l'esame radiologico. Questo caso è il primo

osservato in 10 anni, e il primo di quel tipo nella storia dell'Ospedale dei Bambini di Lima Si fecero dapprima delle standard dell'addome col bambino in piedi e in decubito dorsale, e si vide un'insolita dilatazione dello stomaco che indicava un'occlusione del duodeno al di sopra dell'ampolla di Vater (il vomito non era biliare) L'autore ritiene che questo volvolo gastrico fosse dovuto ad una aero colia del trasverso, che—essendo in rapporto con l'antro gastrico—puo produrre il volvolo Può aver avuto importanza anche una atonia dell'emidiaframma destro, accertata all'intervento Benche le condizioni del bambino fossero migliorate dopo un primo svuotamento dello stomaco, l'intervento fu eseguito ugualmente Lo svuotamento completo, infatti, non era stato possibile con la semplice aspirazione continua Durante l'intervento si osservo che il volvolo si era quasi completamente ridotto, e la riposizione fu completata mediante trazione sul trasverso che si trovava dietro allo stomaco e sotto l'emidiaframma sinistro atonico Furono infine sezionate aderenze fra antro gastrico e angolo destro del colon, probabile importante fattore etiologico

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Studies on Isolated Heart-Lung Preparations in the Hypothermic Animal

A PRELIMINARY EXERCISE FOR HOMOLOGOUS HEART-LUNG TRANSPLANTS

P. K. SEN, M.B., M.S., F.I.C.S., C. B. SHAH, B.S., M.B.
AND
R. S. SATOSKAR, B.S., M.B.
BOMBAY, INDIA

SINCE the pioneering spirit of Alexis Carrel entered the field of tissue transplants, the energy of laboratory and clinical workers has been directed more and more toward the achievement of Carrel's dream — transplantation of a whole organ or a group of organs. From being merely an interesting but cumbersome exercise in the laboratory, such experiments have entered the realm of clinical medicine. The use of substitute organs or artificial aids to total function, such as the artificial kidney[1] and the artificial heart-lung machine,[2] have brought meaning of application to the earlier experiments of physiologists with isolated organs. Although grafts of tissues or tissue-organs have reached a stage when the limitations and indications of such procedures are widely and correctly appreciated, similar knowledge has not been arrived at with regard to total transplants of organ groups. The reliability and usefulness of any such transplant remains a completely open question today, but the ultimate success of such transplants seems to be not unlikely in the future, at least with regard to some of its functions. The recent success (although a limited one) with kidney transplants has served to encourage workers in the field and in 1953 in Philadelphia, the first attempts of artificial heart-lung transfers were made by Bailey and his co-workers[3] at Hahnemann Medical Centre, with partial success.

The problem of transferring the whole heart, together with the lungs, from one animal to another presents many problems of great complexity, of which only one is the cessation of circulation that must follow during such a transfer in the organism. Our researchers with hypothermia seemed to provide an answer to this difficulty; i.e., in the state of hibernation, the brain can withstand stoppage of circulation for much longer periods than at normal temperatures. It was argued by us, therefore, that if such transfers were to take place from one cooled animal to another and if the time required for such transfers did not exceed the average limit of safety, it might be possible to obtain such transfers without producing any cerebral damage. Accordingly, the following experiments were performed.

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Method and Materials. — Our method consisted of removing an intact heart-lung preparation whose circulation and economy were interdependent and were together self-supporting, as it were. Adult mongrel dogs were used throughout this series.

Anesthesia was induced with intravenous sodium pentothal (50 mg. per kilogram of body weight). Positive pressure and hyperventilation with air (48 times per minute) were given through an intratracheal tube, and the animal was immersed in ice-cold water until the rectal temperature, measured by a thermocouple, dropped to 26 C. (Hyperventilation materially reduces the chances of ventricular fibrillation. The details of this technic have already been described by us elsewhere.)

The animal was then strapped on the table in the supine position. A transverse incision was made across the fifth interspace. The chest was entered through the fifth intercostal space, and the sternum was sectioned transversely at that level after ligation of the internal mammary arteries. (This gives excellent and wide access to the entire thoracic cavity.) A rib spreader was introduced, and dissection was begun in the superior mediastinum. The superior vena cava was freed; the pericardium was opened, and the ascending aorta was dissected free from the small anterior pad of fat (the coronary pad) that hides most of the ascending aorta. The inferior vena cava was next dissected and a loop placed around it. The cardiac lobes of the lungs were dissected free from the diaphragm and the plane of separation extended in the posterior mediastinum behind the heart and the pericardium, the heart being lifted up with the pericardium and the dissection carried up to the root of the lungs and the base of the heart. The heart was rotated forward; this exposed the bronchial arteries arising

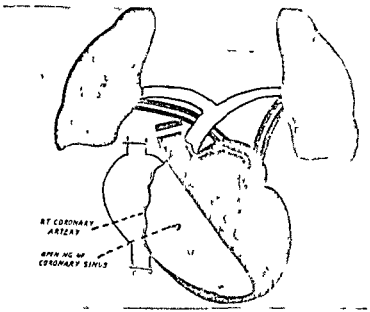

Fig. 1.—Diagrammatic representation of isolated heart-lung.

from the descending portion of the aorta. The bronchial arteries were clamped, ligated and divided between ligatures. The azygos vein was likewise ligated and divided. At this point the stage was set for the separation of the heart-lung preparation.

With a timekeeper calling out the minutes, the separation was begun. The venae cavae were ligated and divided. A clamp was placed across the terminal part of the ascending portion of the aorta, blocking the left ventricular outflow. One cc. of 1.2 per cent potassium chloride was then injected into the left ventricular chamber, so that the potassium would perfuse the coronary system (this again reduces the likelihood of ventricular fibrillation developing[4]). The aorta was divided between the first clamp and another clamp placed just distal to it. Lifting up the entire heart-lung preparation then made it possible to dissect in the natural fascial planes of separation, dividing the nerves — the vagi, the sympathetic nerves and the phrenic nerves—and the entire specimen could therefore be mobilized by incision of its attachment to the trachea. The intratracheal tube was then removed and the trachea sectioned high in the thorax. The entire preparation was then brought out

of the thorax and laid on a sterilized towel. Another intratracheal tube with a cuff was rapidly introduced into the stump of the divided trachea. A ligature was passed around the soft trachea and tightened on the tube to make the attachment more secure and air tight. The heart continued to beat strongly and regularly throughout the separation, transfer and extracorporeal placement of the heart-lung preparation.

Although electrocardiographic changes are impossible to record accurately during the removal, they can be taken after separation by direct cardiac leads. Twelve such experiments are being reported here. We were able to have the extracorporeal heart-lung preparation functioning, with rhythmic contractions and adequate oxygenation of the coronary system, for varying periods—in 1 instance as long as one hour. The accompanying table indicates the behavior of such specimens.

The circulation in the specimen takes place as follows (Fig. 1) : Blood entering from the right atrium and the coronary sinus passes from the right ventricle into the pulmonary artery, is oxygenated by the lungs, returns to the heart by way of the pulmonary veins in the left atrium and is then pumped out into the aorta by the left ventricle, where it enters the coronary system and, after perfusing the heart, returns to the right atrium by the coronary sinus and the thebesian veins.

Behavior of the Isolated Heart-Lung Preparation.—While artificial respiration is administered 48 times per minute the ventilation remains more than adequate, and throughout the period of survival the specimen, as well as the heart and the coronary arteries, remains pink. As will be seen from the accompanying table, the total period of survival varied from *nine minutes to one hour*, but the period of effective strong beats averaged around *ten minutes*. In 1 instance effective beats continued for as long as *twenty-five minutes* and in 2 dogs up to *eighteen minutes*, but

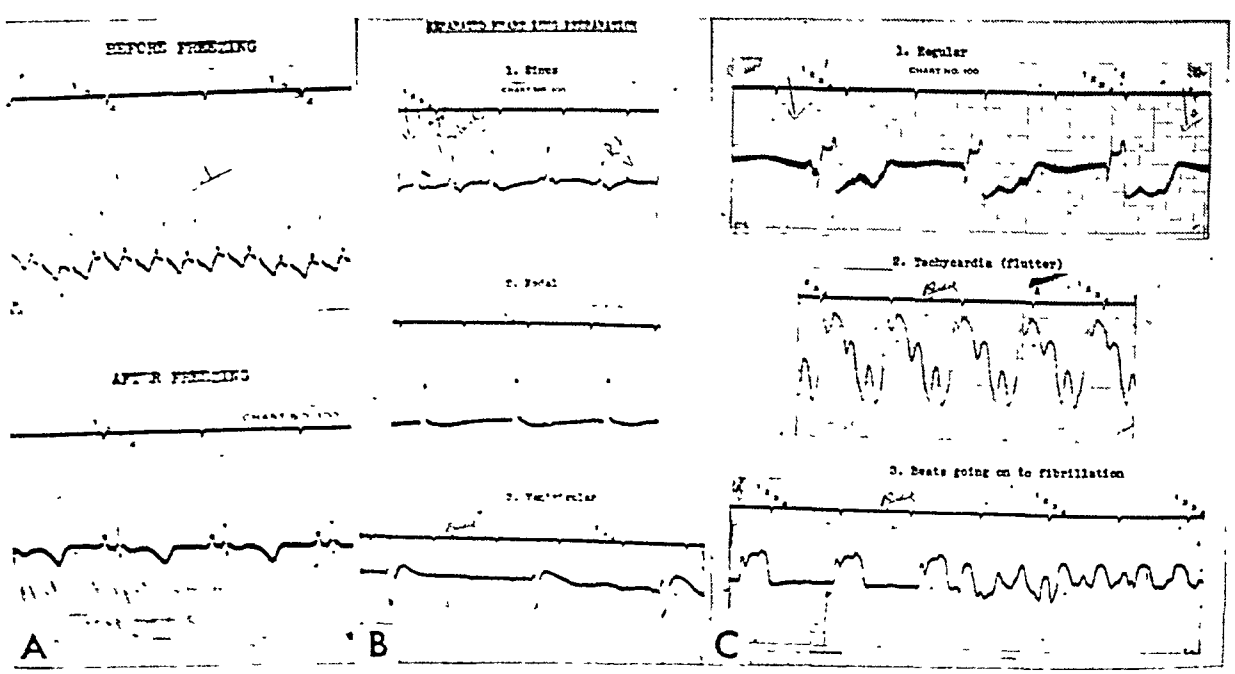

Fig. 2.—Sample electrocardiograms obtained during the experiments. *A*, intact animal before and after freezing (Lead II, normal standardizzation). *B*, types of rhythm in the isolated specimen (direct cardiac leads; standardization one-tenth normal. *C*, bizarre rhythms observed in the isolated specimen (direct cardiac leads; standardization one-tenth normal).

this was mainly achieved through the agency of drugs — calcium, digitalis and epinephrine

The modality of contractions varied greatly Sinus rhythm was observed but occasionally, and in the majority a nodal rhythm was present during the greater part of the period of survival Ventricular rhythm appeared during the later phases, often taking extremely bizarre patterns As a terminal phenomenon, ventricular fibrillation developed in almost all preparations, sometimes preceded by tachycardia or flutter Cardiac atony was not encountered in the majority until about ten minutes after (the period of effective beats) when changes in both rhythm and toxicity were evident Heart blocks of various types developed in most specimens at this stage Often the auricles kept beating rhythmically even after ventricular fibrillation had developed and become irreversible

In one specimen (Dog No 248) ventricular fibrillation developed during removal as the root of the aorta was being dissected and clamped After removal, injection of prostigmine and potassium into the left ventricle and cardiac massage did not have any effect However, injection of 1 cc of 1/20,000 epinephrine suddenly brought back sinus rhythm This conversion seemed to us entirely paradoxical, the usual response to the injection of epinephrine into a cold heart in our experience, is the development of ventricular fibrillation [4]

Since the electrocardiograms (Fig 2) were taken by direct cardiac leads, some evidence of injury pattern was seen in almost all tracings, but occasionally this was greatly exaggerated during marked elevation of the ST segment Since inversion of the T wave is a usual accompaniment of deep hypothermia, the changes in the T wave could not be regarded as significant, but in most specimens the T wave, which

Behavior of the Isolated Heart Lung

No Dog	Total Period of Survival Minutes	Period of Rhythmic Beats Minutes	Period of Effective Beats Minutes	Beats per Minute Maximum	Beats per Minute Minimum
238	9	8	4	100	7
240	35	22 minutes after initial irregularity	18	100	27
247	25	20	18	90	15
248	11	7	5	65	10
249	27	18	13	75	10
250	32	32	7½	100	15
251	33	33	23	60	15
252	21	19½	9½	100	20
254	25	14	10	75	15
260	30	25	25	100	16
286	60	50	25	75	10
279	50	40	15	60	10

had become upright after injection of potassium into the left ventricle prior to removal of the specimen, became gradually flattened and ultimately inverted as the beats in the isolated specimen became weaker and the heart grew flabbier

COMMENT

That the isolated heart-lung with the coronary circulation intact can survive for some time as an independent self-supporting unit outside the body seems evident from these experiments The period of survival, however, was relatively short, and the period of effective cardiac contractions (average ten minutes) was not long enough to justify an immediate serious trial of the second phase of our undertaking, namely, actual transfer of a heart-lung preparation from one frozen animal to another Most of the time required for this transfer would be expended on the anastomosis of the three great vessels—the two venae cavae and the ascending aorta Although a rapid anastomosis can

be devised with either an indwelling plastic tube or a glass tube, such procedures would have only temporary value. The system will have to be heparinized before any such step is undertaken, and that would further complicate the technical problems involved. We are therefore engaged now in trying to increase the time of survival and, in addition, the span of effective cardiac beats in such a specimen. It has occurred to us that the heart-lung preparation is an extremely unbalanced system as far as the two sides of the circulation are concerned—the left side being restricted entirely to the small coronary circulation and the right (pulmonary) side remaining unimpaired in extent and volume. As the left ventricular contractions pump the blood out through the coronary circulation to the right side, it tends gradually to get lost in the large pulmonary bed, and since the *vis-a-tergo* situation created by the negative suction within the thorax is missing, the venous return from the lung and the pulmonary veins to the left atrium is also gradually diminished and continues to fall. This leads to the development of a vicious circle by which less and less blood is pumped out of the left ventricle into the coronary circulation and more and more blood pools on the right as less and less blood arrives from the lung to the left atrium by way of the pulmonary veins. Such a state of affairs would ultimately lead to anemic myocardial anoxia, cardiac atony and ventricular fibrillation. In order to overcome this difficulty we have tried to reduce the size of the pulmonary vascular bed by clamping one of the pulmonary arteries and injecting small amounts of physiologic solution of sodium chloride into the left ventricle. This was done in the last 3 experiments of this series. The survival time in these 3 was much longer than the average.

Not only is it necessary that such an isolated heart should continue to contract powerfully during the period of transfer, but at the end of transfer it should be able to take on the larger load of normal circulation. The disparity between coronary circulation and the entire left-sided circulatory volume and resistance that the left ventricle has usually to deal with is so great that it may be necessary to bring about such a change of pressures gradually. This and many other technical and physiologic complexities have to be solved before heart-lung transplantation is generally feasible. In any case, the possibility of such transplants does not appear to be too distant in the future.

SUMMARY

A preliminary exercise in homologous heart-lung transplant in the hypothermic animal, namely, the isolation of a self-supporting heart-lung preparation, is described. The data on 12 consecutive experiments are presented. The total period of survival of the isolated heart-lung varied from nine to sixty minutes. The behavior and the electrocardiographic patterns of the isolated specimens are discussed. Introduction of physiologic solution of sodium chloride into the left ventricle and the clamping of one pulmonary artery appeared to increase the effective functional life of such specimens.

ZUSAMMENFASSUNG

Es wird über vorläufige Versuche am homologen Herzlungentransplantat bei Tieren mit unternormalen Temperaturen, d.h. über die Isolierung eines sich selbst erhaltenden Herzlungenpräparates berichtet. Es liegen die Daten über zwölf aufeinander folgende Versuche vor. Die gesamte Überlebenszeit des isolierten Herzlungenpräparats schwankte zwischen neun und sechzig Minuten. Das Verhalten und die elektrokardiographischen Kurven

der isolierten Praparate werden erortert. Es zeigte sich, dass die Einfuhrung von physiologischer Kochsalzlosung in die linke Herzkammer und die Abklemmung einer Lungenarterie das leistungsfahige funktionelle Leben solcher Praparate erhohte

RIASSUNTO

Viene descritto il tempo preliminare del trapianto omologo cuore-polmone nell'animale ibernato, e cioè l'isolamento di un preparato autosufficiente di cuore-polmone L'esperimento è stato ripetuto 12 volte, il periodo totale di sopravvivenza del cuore-polmone isolato varia da 9 a 60 minuti. Vengono discussi il comportamento e i quadri elettrocardiografici della preparazione. Sembra che il periodo di sopravvivenza possa aumentare se si introduce soluzione fisiologica nel ventricolo sinistro e si chiude una delle arterie polmonari

RÉSUMÉ

L'auteur décrit une expérience préliminaire de greffe homologue de coeur-poumon chez un animal en hypertherme, à savoir l'isolation d'une préparation indépendante de coeur-poumon. Les données de 12 expériences consécutives sont présentées. La durée totale de survie du coeur-poumon isolé a varié entre 9 et 60 minutes Le comportement ainsi ques les courbes électrocardiographiques des spécimens isolés sont discutés L'introduction d'une solution physiologique de chlorure de sodium dans le ventricule gauche, et le clampage d'une artère pulmonaire ont montré une augmentation de la vie fonctionnelle des spécimens décrits

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Varicose veins are the result of an improper selection of grandparents One can get along with a few ounces of kidney and less liver The liver is comparatively harmless and useless It was put in merely for packing purposes

—*Osler*

The Newer Types of Cardiac Investigation

KAMALA VYTILINGAM, M.D.

MADRAS, INDIA

THERE are a number of cardiac abnormalities that can be diagnosed with comparative ease by simple clinical methods, without recourse to special studies. Some of these are patent ductus arteriosus, vascular ring, mitral stenosis and even the tetralogy of Fallot. Special diagnostic procedures nevertheless have their place in evaluation of cardiac status, particularly when cardiac surgical intervention is contemplated.

The cardiac lesions amenable to surgical treatment are as follows: patent ductus arteriosus; coarctation of the aorta; vascular ring; the tetralogy of Fallot (and other congenital cyanotic cardiac conditions); mitral stenosis; pulmonary stenosis; constrictive pericarditis; auricular septal defects, and transposition of the great vessels.

The newer types of cardiac investigation are (1) cardiac catheterization, (2) angiocardiographic investigation, (3) electrocardiographic study, (4) roentgen and fluoroscopic examination and (5) special laboratory tests.

1. *Cardiac catheterization* is particularly important in the diagnosis of congenital heart disease, and it is really a physiologic tool in the solving of various problems. During the procedure the following points should be remembered:

a. The catheter should be removed only under fluoroscopic guidance.

b. Pressures should be recorded from the chambers of the heart and great vessels. The normal blood pressure in the right auricle is plus 5 to minus 5 mm. of mercury; in the right ventricle it is 25 mm. of mercury, and the pressure in the pulmonary artery in millimeters of mercury is said to be 25 systolic and 10 diastolic. Deviations of pressure indicate hemodynamic disturbances caused by congenital or acquired heart disease; for example, a typical M-shaped auricular tracing is associated with constrictive pericarditis. In the presence of pure pulmonary stenosis the pressure in the right ventricle goes higher than the systemic pressure. The pressure in the pulmonary artery is raised to a very high level in cases of pure pulmonary hypertension.

c. The oxygen content of the blood in the various chambers of the heart, the superior and inferior vena cava, the pulmonary artery and the aorta should be determined. Van Slyke's blood gas apparatus or Beckman's oximeter may be used for gas analysis. Normally the venous blood does not mix well until it has reached the right ventricle, and there is little difference in the oxygen content of the blood in the superior vena cava, the right atrium, the right ventricle and the pulmonary artery. If there is a defect between the two auricles the oxygen content of the right auricular blood may be significantly higher than that of the blood in the superior vena cava. If there is a ventricular septal defect the oxygen content of the blood in the right ventricle is higher than that of the blood in the right auricle. In the presence of patent ductus arteriosus the oxygen content of pulmonary arterial blood will exceed that of the right ventricular blood.

d. The volume of blood flowing through the various portions of the circulatory tree and the intracardiac and extracardiac

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shunts may be calculated from the oxygen uptake in the lungs

e Roentgenographic determination of the position of the catheter adds some information toward the final diagnosis For example, the catheter may pass through an overriding aorta into the arch, or through the ductus into the descending portion of the aorta In the presence of an atrial septal defect the catheter may pass through the defect into the left atrium and the pulmonary veins

f Selective angiocardiographic study may be done by injecting diodrast through the catheter into the heart so as to visualize the various chambers and the great vessels

g Intracardiac electrocardiographic observations add to the diagnostic data

When employed for diagnosis of a congenital anomaly, catheterization of the heart yields more information about a cyanotic than about a noncyanotic condition In patients with cyanotic congenital cardiac malformations, the principal aim of catheterization is usually to determine the pressure in the pulmonary artery and in the cardiac chambers

Cardiac catheterization gives little or no information concerning the left side of the heart

2 *Angiocardiographic investigation* is another procedure for the study of malformed heart It reveals the following signs

a Right to left shunts, as in cases of atrial septal defect

b Simultaneous opacification of the aorta whenever this great vessel overrides the ventricular septal defect, as in Eisenmenger's complex

c Lingering of the contrast medium in the pulmonary arterial segment and in the right ventricle in the presence of pure pulmonary stenosis

Selective angiocardiographic study is another diagnostic procedure, already described The aortogram and retrograde aortogram, if successful, provide data as to the position of constrictions if coarctation of the aorta is present, they also indicate the presence of atypical ductus arteriosus

3 *The electrocardiogram* is another useful adjunct, especially since the advent of the precordial and unipolar limb leads It offers proof of dextrocardia and of the anomalous origin of the left coronary artery from the pulmonary artery It indicates the relative thickness of the two ventricles and gives a clue as to the nutrition state of the myocardium 'P pulmonale' is diagnostic of cor pulmonale A left axis deviation in a patient with persistent cyanosis is always suggestive of tricuspid atresia combined with defective development of the right ventricle A wide notched P wave is highly suggestive of left auricular enlargement The electrocardiogram is an aid also in proving that complete heart block is present

4 *Roentgen and fluoroscopic examinations* reveal changes in size and contour of the heart and great vessels It is essential to study the shape of the heart in the anteroposterior position and in both left and right oblique positions In the anteroposterior the combined size of the two ventricles, the presence, absence or fullness of the pulmonary conus and the size of the pulmonary artery are readily seen A concave curve at the base of the heart to the left of the sternum indicates that the pulmonary artery is small, absent or misplaced Examination in the left anterior oblique position shows the relative size of the ventricles and provides a good view of the ascending aorta and the aortic and pulmonary windows Examination of the heart in the right anterior oblique position offers evidence of the course of the aorta and the size of the left auricle An enlarged left auricle causes backward displacement of the barium-filled esophagus Pulsations

in the lung fields, when present, are indicative of excessive blood flow to the lungs.

5. *Special laboratory tests* to estimate the fall or increase in oxygen consumption per liter of ventilation are helpful in differentiating the tetralogy of Fallot from Eisenmenger's complex. The hemoglobin level, the hematocrit reading and the erythrocyte count supply clues to the progressive nature of cyanosis in cyanotic children.

Mention will now be made of some of the cardiac lesions that are amenable to surgical treatment, and of their diagnostic features.

Patent Ductus Arteriosus.—The diagnosis is not difficult when the typical sign is present, i.e., a continuous murmur with late systolic and early diastolic accentuation. The existence of left axis deviation is diagnostic, because in practically all other conditions associated with a large pulmonary artery there is right axis deviation. The roentgenogram shows enlargement of the pulmonary and aortic knobs, with pulsations in the hilum so strong as to suggest a hilar dance. *Catheterization of the heart* will show a rise of normal pressures in the right atrium, right ventricle and pulmonary artery whenever there is an increase of resistance in the pulmonary vessels. There is a significant increase in the oxygen content of the blood in the pulmonary artery. The pulmonary flow is higher than the systemic flow. The angiocardiogram reveals the patency either as a filling defect or as reopacification of the pulmonary artery at the time when only the left ventricle and aorta are visualized. In questionable cases the retrograde aortogram will show the filling of the pulmonary artery through the ductus.

In the condition called "reversed ductus" the pulmonary arterial pressure is so high that blood flows from the pulmonary artery to the aorta. Consequently, cyanosis of the feet will increase. The electrocardiogram shows right axis deviation and right ventricular hypertrophy. Ligation of the ductus is contraindicated in the presence of this anomaly.

Coarctation of the Aorta.—The diagnosis is based upon the observation of a strong pulse in the upper limbs, combined with weak or absent pulsation in the legs and pulsations over the collateral vessels, which are usually in the interscapular area. The roentgenogram will show notching of the ribs. This sign is seldom seen in patients under 12 years old.

As coarctation may occur in unusual sites, it is important to identify the site of coarctation, prior to operation, by means of an aortogram. The optimum age for operation is between 6 and 20 years. The procedure will be more beneficial if the aorta is allowed to approach its adult size.

An additional malformation such as aortic insufficiency, is usually an added indication for surgical intervention. Symptomless patients are better left alone. I have 1 patient, a man aged 42, attending the outpatient department, with all the signs of coarctation of aorta but in no need of surgical treatment.

Vascular Ring.—A vascular ring about the trachea and the esophagus may be composed of several remnants of the embryonic arch system. The commonest type is the double aortic arch. Roentgen examination of the trachea and the barium-filled esophagus is the most important diagnostic step in the case of a child with this abnormality. Occasionally, instillation of lipiodol into the trachea or, rarely, angiocardiographic investigation may be necessary. Early operation, with excision of the constricting vessels, is advocated.

Tetralogy of Fallot. — This condition ranks next to patent ductus arteriosus. The diagnosis is based on the typical clinical signs: cyanosis, clubbing, a heart of normal size, a basal systolic murmur and

a pure second sound The electrocardiogram shows left axis deviation In the roentgenogram the normal fullness of the pulmonary conus is absent the lung fields are clear Fluoroscopic study reveals no pulsations at the hilum Factors influencing the selection of patients for operation are (1) the age and size of the patient, (2) the severity of anoxemia, and (3) the erythrocyte count, the hemoglobin level and the hematocrit reading

The optimum age is between 8 and 14 years Attacks of dyspnea are common in infants with this condition particularly those between 4 and 18 months of age Prolonged syncope at any age indicates surgical intervention

The degree of incapacity varies greatly It is surprising to see children with the tetralogy of Fallot walk about with an oxygen saturation level of about 50 per cent Oxygen saturation below 30 per cent is a cause for grave concern If the red blood cell count is between 8,000,000 and 10,000,000 per cubic millimeter or the hematocrit reading between 70 and 80, the child is in great danger of cerebral thrombosis and needs immediate surgical intervention Since dehydration increases the danger of thrombosis, a child with a high erythrocyte count should be given 1½ to 2 quarts of liquid per day prior to the operation Blalock Taussig or Potts anastomosis is the treatment of choice

There are two other conditions that present more or less the same clinical picture as does the tetralogy of Fallot (1) pure pulmonary stenosis with a patent foramen ovale and (2) tricuspid atresia with pulmonary stenosis Catheterization of the heart will help to differentiate these conditions An additional point to remember is that left axis deviation is present in cases of tricuspid atresia Angiocardiographic study will not help in the differential diagnosis of these conditions

The Blalock-Taussig or Potts anastomosis is designed to increase the circulation to the lungs It should be beneficial, therefore, to any patient whose primary difficulty is lack of adequate pulmonary blood flow, provided the structure of the heart is such that it can adjust to the altered circulation

Pure Pulmonary Stenosis —This condition is also amenable to surgical correction Its diagnosis is based on the following data The heart is enlarged to the right, there is a systolic murmur, with a thrill in the pulmonary area The second sound is weak or absent The roentgenogram shows decreased vascularity of the lung and poststenotic dilatation of the pulmonary artery in the valvular type of pulmonary stenosis

Evidence of right ventricular hypertrophy and right auricular enlargement is apparent in the electrocardiogram The patient complains of dyspnea on exertion and shows minimal cyanosis Cardiac catheterization may have to be done in some "problem" cases In the presence of pure pulmonary stenosis the results of catheterization will be as follows

1 High right ventricular pressure varying in millimeters of mercury, from 65 systolic and 5 diastolic to 190 systolic and 0 diastolic

2 Normal or low pressure in the pulmonary artery, varying, in millimeters of mercury, from 12 systolic and 0 diastolic to 20 systolic and 14 diastolic

3 High atrial waves in pressure tracings of the right atrium

Indications for operation are (1) right ventricular pressure as high as systemic pressure, or higher, (2) progressive enlargement of the heart, (3) a right ventricular "strain pattern" in the electrocardiogram, and (4) increasing dyspnea and cyanosis For pure pulmonary stenosis the procedure of choice is valvulotomy followed by dilation, according to Brock For infundibular stenosis, infundibulec-

tomy is being tried. The Blalock-Taussig anastomosis is contraindicated for this condition.

Mitral Stenosis.—The successful treatment of mitral stenosis is one of the recent conquests of cardiac surgery. The diagnosis is based largely on the results of auscultation—a diastolic presystolic rumble in the mitral area, with a presystolic thrill. The roentgenogram shows a typical mitral configuration. Candidates for operation are patients with moderate mitral regurgitation or none, with no evidence of left ventricular enlargement and no aortic or tricuspid defects. The best results are obtained in patients between the ages of 20 and 45 years, who may present paroxysmal attacks of dyspnea, pulmonary edema or hemoptysis.

Intractable failure of the right side of the heart, rheumatic activity, bacterial endocarditis and severe pulmonary arteriosclerosis are definite contraindications to mitral volvulotomy.

Catheterization of the right side of the heart may supply evidence of failure or pulmonary arteriosclerosis. Clinical and laboratory data usually indicate the existence of other valvular defects, rheumatic carditis or bacterial endocarditis.

Constrictive Pericarditis. — Most patients with this condition need surgical intervention. The diagnosis of this condition is difficult. The clinical picture of superior and inferior caval compression should be looked for. Diffuse constrictive pericarditis should be differentiated from rheumatic heart disease with mitral and tricuspid stenosis. In case of doubt, cardiac catheterization will reveal high venous pressure in the superior vena cava and normal or low pressure in the right auricle when the predominant constriction is around the vena cava. High venous and right atrial pressures with low right ventricular pressure indicate compression of the right atrium. High pressures in the right ventricle and the pulmonary artery indicate constriction of the left side of the heart. Interesting data may be obtained by pneumomediastinum.

Tubercular Pericarditis.—Operation for this disease may well be undertaken at the time of effusion and before organization of the exudate.

SUMMARY

Various modern methods of investigating cardiac abnormalities are outlined, including cardiac catheterization, angiocardiographic procedures, the taking of *electrocardiograms, roentgen and fluoro*scopic examination and certain laboratory tests, such as estimation of the increase or decrease of oxygen consumption per liter of ventilation. Although several cardiac diseases, including patent ductus arteriosus, vascular ring, mitral stenosis and even the tetralogy of Fallot, can be diagnosed by simple clinical methods, the new procedures have their place in evaluation of the status of the heart, especially when a cardiac operation is contemplated.

Cardiac lesions amenable to surgical therapy are patent ductus arteriosus, coarctation of the aorta, vascular ring, the tetralogy of Fallot (and other congenital cyanotic conditions), mitral stenosis, pulmonary stenosis, constrictive pericarditis, auricular septal defects and transposition of the great vessels. The indications for operation are presented, with comments on the suitable technics to be used in the presence of various cardiac pathologic conditions.

RIASSUNTO

Vengono descritti i moderni metodi di indagine cardiologica, e cioè il cateterismo cardiaco, l'angiocardiografia, l'elettrocardiografia, l'radioscopia e la radiografia e alcuni test di laboratorio come la valutazione del consumo di ossigeno. Mentre

alcune gravi affezioni cardiache quali la pervieta del dotto arterioso, l'anello vascolare, la stenosi mitralica e la tetralogia di Fallot possono essere diagnosticate clinicamente, i nuovi metodi consentono di valutare lo stato del cuore soprattutto quando si deve procedere ad un intervento cardiaco

Le lesioni cardiache passibili di terapia chirurgica sono il dotto arterioso pervio coartazione dell'aorta l anello vascolare la tetralogia di Fallot e le altre cianosi congenite, la stenosi mitralica, la stenosi polmonare, la pericardite costrittiva la pervieta del setto auricolare, la trasposizione dei grandi vasi Vengono elencate le indicazioni a questi interventi e le tecniche più appropriate

ZUSAMMENFASSUNG

Es werden verschiedene Methoden der Untersuchung von Herzanomalien beschrieben Dazu gehoren die Katheterisierung des Herzens die Angiokardiographie, die Elektrokardiographie, die Rontgenuntersuchung des Herzens und gewisse Laboratoriumsuntersuchungen wie die Abschatzung des Anstiegs oder des Abfalls des Sauerstoffverbrauchs pro Liter eingeatmeter Luft Wenn auch manche Herzerkrankungen einschliesslich des offenen Ductus Botalli, der Verengung der grossen Gefasse, der Mitralstenose und sogar der Fallotschen Tetralogie mit einfachen klinischen Untersuchungen erkannt werden konnen so haben doch die neuen Methoden ihren Platz in der Auswertung des Herzzustandes besonders wenn ein operativer Eingriff am Herzen in Erwagung gezogen wird

Zu den Herzerkrankungen, die chirurgischer Behandlung zuganglich sind, gehoren der offene Ductus Botalli, die Einengung der Aorta die Fallotsche Tetralogie (und andere angeborene zyanotische Zustande) die Mitralstenose, die Pulmonalstenose, die verengende Perikarditis Defekte des Vorhofsseptums und die Transposition der grossen Gefasse Die Indikationen zur Operation werden angegeben und auf die bei verschiedenen Herzerkrankungen geeigneten und anwendbaren Techniken wird eingegangen

RÉSUMÉ

L auteur passe en revue diverses methodes modernes de diagnostic des anomalies cardiaques y compris le catheterisme l angiocardiographie, l electrocardiogramme l'examen radiologique et fluoroscopique et certains examens de laboratoire Bien que plusieurs affections cardiaques puissent etre diagnostiquees par les seules methodes cliniques, les nouvelles techniques ont leur place dans l'evaluation du status cardiaque, surtout dans l'eventualite d'une operation Les affections cardiaques du ressort de la chirurgie sont entre autres un canal de Botal net, le retrecissement aortique la tetralogie de Fallot (ainsi que d'autres etats cyanotiques congenitaux), la stenose mitrale la stenose pulmonaire la pericardite constrictive, les lesions auriculaires septiques, la transposition viscerale Les indications operatoires sont presentees et les meilleures techniques a utiliser en presence des differentes lesions cardiaques sont commentees

Genitourinary Surgery

Experience with Lower Pole Calyx Approach to Kidney Stones

JOHN S. CARMAN, A.B., M.D., F.R.C.S. (Can.), F.I.C.S., AND H. S. BHAT, M.D., M.S.

VELLORE, INDIA

NEW surgical technics develop gradually, with additions and corrections made by various surgeons. Sometimes a new technic is chiefly suited to the surgeon who devises it; sometimes the new technic, or modifications of it, will be useful to many. We wish to describe our experience with the lower pole approach to kidney stones as described by Lowsley and Kirwin, with several modifications of our own, in order that others may try this method.

There are difficulties in both the classic nephrolithotomy and the classic pyelolithotomy approach. The chief of these is hemorrhage. The long incision in the renal cortex, whether the surgeon finds the so-called bloodless line or not, leads to considerable bleeding during the operation unless great care is given to compression of the renal vessels by the assistant's fingers or, more effectively, by a soft rubber catheter tourniquet. While hemorrhage may not be a problem during pyelolithotomy in an extrarenal type of pelvis, it is likely to be more troublesome in the intrarenal type during removal of the stone or by the pressure of drainage tube.

The danger from postoperative hemorrhage seemed to be real in cases in which the classic nephrolithotomy was done, as well as in some cases of pyelolithotomy. We were looking, therefore, for a better approach and a better method of closure.

Lower Pole Approach with Ribbon Gut Closure.—We arrived at this in the lower pole approach described first by Lowsley. Essentially, the approach is similar to that of the classic nephrolithotomy except that the incision is short and is made opposite the lower pole calyx. Sometimes the passage between the calyx and the pelvis needs to be dilated to some extent. Stones in the lower pole calyx, anywhere in the pelvis, and in the upper calyces can all be reached, loosened and delivered to a point in the pelvis where they can be lifted out through the incision with an Allis forceps.

To make sure that the incision is being made in the right place, one has only to refer to a good intravenous or retrograde pyelogram. One must be careful also to direct the knife, the dilating clamp and the finger in the direction of the calyx and the renal pelvis rather than beside it. If the stone is a very large one, we consider it better to use this small incision, to free the stone if possible with the finger and then to enlarge the incision slightly at the time of removal of the stone already freed. This leads to less damage to the kidney and less hemorrhage.

Although either the operating surgeon or the assistant compresses the renal vessels while the small incision is made, this compression can be removed as soon as the finger is inserted into the opening, for pressure of the examining finger prevents

From the Christian Medical College Hospital, Vellore, North Arcot District, India.

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quite a bit of hemorrhage. On the other hand, we think it wise to compress the hilar vessels again during removal of the stone with the forceps. This can be done with the same fingers which stabilize the stone in the lower renal pelvis, keeping it from slipping back into a position where the forceps may not reach it.

The second feature of the Lowsley and Kirwin operation included two points: (1) the use of ribbon gut to close the incision in the kidney, and (2) the use of fat in the line of incision instead of muscle, which had been used by many surgeons.

First Modification: Fascia Instead of Ribbon Gut.—Dr. Lowsley used ribbon catgut. Since we had none available, our first modification was to use strips of fascia from the edge of the incision in the external oblique aponeurosis.

This worked well except for one defect. The intimate capsule of the kidney tends to tear easily and also to strip. The Lowsley technic of drawing the incision together with a broad suture had a great advantage over previous methods of suture, viz., a mattress stitch that included a segment of the kidney itself. As Lowsley pointed out, this type of suture always led to necrosis of the portion of renal tissue included in the mattress stitch.

Our experience agreed with that of Lowsley and Kirwin in that a bit of fat tissue placed in the line of incision at the time of tying the sutures produced rapid and effective hemostasis. Fat from the fatty capsule is much more easily available than muscle, although both are exposed in this operation. Taking a piece of fat from the fatty capsule for this purpose, however, led us to our next important modification in the Lowsley technic.

Second Modification: Use of Fatty Capsule in Closure.—With the lower pole calyx approach for kidney stone it is not necessary to expose much of the kidney. This led us to question: "Why is it necessary to strip off or separate the fatty capsule and to see more than a very small area of the intimate capsule of the kidney?" Actually, our first reason for not separating the fatty capsule was that the closure is more easy and effectual if the fatty capsule is left in place and the sutures are placed through fatty capsule and intimate capsule together on each side of the incision. This eliminated the tearing of the intimate capsule we had encountered with the use of fascia as a substitute for ribbon gut.

We then found that neither ribbon gut nor fascia was necessary, because if the fatty capsule and the intimate capsule were brought together with two or three sutures of fine catgut we had the advantage of both parts of the Lowsley technic, namely, a closure that did not damage the renal substance and very good hemostasis from the use of fat in the line of incision; and, in this modification, the fat was not a separate piece, but the living fat tissue of the fatty capsule. (Use of fat for hemostasis in the renal wound has also been described by others.)

Third Modification: Fatty Capsule Left Intact.—Our present technic, therefore, is to enter the outer capsule of the renal fossa through a small incision that can be enlarged to expose the fatty capsule of the kidney and then to mobilize the kidney by simple separation with the fingers in the planes of the loose areolar tissue outside the main fatty capsule. One can thus palpate the kidney, the renal pelvis and the ureter without complete exposure of any one of them. The lower part of the fatty capsule of the kidney has an extension on which one can exert a small amount of retraction, and this will not tear if one is careful.

The fatty capsule is opened only to produce a bare area of kidney about 1 by ¾ inch (2.5 by 9.1 cm.). In the center of this the incision is made.

We are now convinced that there is a value in not stripping off the fatty capsule from the kidney. If one examines the surface of a kidney that has been fully exposed in its intimate capsule, one finds that the surface is moist and tends to bleed easily throughout the operation in which the kidney is being handled. There is always a residue of some blood after a nephrostomy, and in our opinion, if this blood remains around the intimate capsule, it inevitably leads to some diffuse scar formation. If there is to be some scar formation after an operation for stone, it should be safer to have the scar outside the fatty capsule rather than surrounding the exposed kidney or the exposed renal pelvis. One can understand this idea by remembering the experiment for the production of hypertension in an animal by fully exposing a kidney and surrounding it with cellophane. Scar formation occurs by cellophane perinephritis. When the scar contracts the kidney is constricted.

A person in whom stones have formed once is likely to have stones again. If one is to be able to operate safely and more than once on a kidney, that kidney and its function must be damaged as little as possible by the operation used for removal of a stone. Internal damage can be cut down by not delaying removal of the stone and thus obviating the damage from pressure on the mucosal lining of the calyx or the renal pelvis. Damage to the outside of the kidney and to its function can be minimized by leaving the fatty capsule in place, and by a method of closure that does not put sutures in the kidney itself but only in a small part of the capsule.

Drainage Catheter.—A variety of catheters are available for use after nephrolithotomy. We have not found it necessary to use the type of catheter that includes an extension to pass down the ureter. We consider this inadvisable and unnecessary unless the tube is needed as a splint for an operation on the ureter or the ureteropelvic juncture. We have found most useful a soft yellow rubber catheter of the "female" length, with one opening on the side and another at the tip. If one opening is closed with blood clot, the other will usually function. We do not favor the use of a self-retention catheter, because of the damage to the renal cortex produced by removal of such a catheter. The catheter is anchored in correct relation to the renal pelvis by tying one of the sutures used for the closure of the fatty and intimate capsules around the catheter. The encircling suture should have an optimium tension, in order to avoid narrowing of the lumen or disturbance of the catheter inside the kidney while the patient changes position.

The outer end of the catheter should be anchored to the skin at the end of the lumbar incision, so that the weight of the connecting tube will not tend to drag on the drainage catheter.

Roentgen Check-Up.—A new addition to our technic that we consider valuable is a roentgen check-up before the nephrostomy catheter is removed. The catheter is ready for removal when the draining urine is clear, i.e., seven to ten days after the operation, and the catgut stitch has been digested or at least become loose. Once or twice we observed urine draining for quite a long time from the nephrostomy wound rather than going down through the ureter. This was corrected by passing a retrograde ureteric catheter and disturbing débris which had collected at the upper end of the ureter. It is possible, however, to predict how the urine will flow after the catheter is removed by introducing about 10 cc. of a radiopaque dye into the nephrostomy catheter. A roentgen plate taken with the patient in the upright position while this is being introduced will demonstrate the patency or nonpatency of the ureter.

Postoperative Care.—The loss of blood,

if any, is made up by blood transfusion during or immediately after the operation Administration of intravenous saline and dextrose is continued, together with continuous intragastric suction and suitable doses of morphine at four-hour intervals, until normal bowel sounds are heard, indicating that the disturbance to the peritoneum (even though the operation was outside the peritoneum) has passed Removal of saline and suction tubes is usually possible within twenty-four hours Ambulation is begun within twenty-four hours Adequate antibiotics are given, depending on the organisms cultured from the urine preoperatively Antibiotics are usually instituted from the day previous to the operation

Our experience is based on the study of 27 cases of renal calculi operated upon by us during the five years from January 1949 to January 1955 Stones were in the upper right calyx in 3 cases In 3 the stones were in the middle calyx on the left side In 8 the stones were lodged in the lower calyx, 3 of which were on the left side In 1 case the stones had re-formed after a previous operation on the same kidney four years before Nephrolithotomy by our modified technic was satisfactory and very little bleeding was encountered at the time of the operation In 7 cases the calculi were lodged in the pelvis of the kidney, and 4 of the latter were in the left renal pelvis The stones were bilaterally placed in 2 patients There was a large staghorn calculus with 12 other stones distributed in the right renal pelvis and the calyces in one patient In 2 patients the left kidney showed moderate hydronephrosis due to lodgement of the stones in the ureteroplevic juncture In all cases in which the stones were situated in the calyces the portion distal to the stones showed varying degrees of dilatation

In all patients the urine showed evidence of infection The average duration of hospitalization was fifteen days In 10 cases the urine was sterile at the time of discharge and in 6 others it was sterile within two months of the operation In 2 patients the urine continued for some time to show growth of Bacillus pyocyaneus, but the roentgenograms did not show any more calculi forming, and at the time of writing the patients have no symptoms No information is available about the remaining 8 Sensitivity tests were done preoperatively in 5 cases so that appropriate antibiotics could be given In 6 cases the antibiotics were changed, depending on the results of sensitivity tests of the urine four days after the operation Intravenous pyelographic studies were done in all cases and retrograde studies in 7 In 2 cases there was some secondary hemorrhage through the nephrostomy tube on the sixth and the eighth postoperative day respectively No active treatment was needed

SUMMARY

A few modifications practiced by the author of the original technic of Lowsley for removal of renal stones through the calyx of the lower pole of the kidney are described A short survey of 27 cases in which the author operated for renal stones is presented

RÉSUMÉ

L'auteur décrit quelques modifications qu'il a apportées à la technique originale de Lowsley pour l'ablation de calculs renaux par le calice du pôle inférieur du rein Il expose brièvement 27 cas de calculs rénaux ainsi operés

RIASSUNTO

Vengono descritte alcune modificazioni al metodo originale di Lowsley per l'asportazione di calcoli renali attraverso il calice del polo inferiore del rene L'autore ha usato questo metodo in una serie di 27 casi che vengono presentati in riassunto

ZUSAMMENFASSUNG

Der Verfasser berichtet über einige Modifizierungen, denen er die ursprünglich von Lowsley angegebene Technik zur Entfernung von Nierensteinen durch den Kelch des unteren Nierenpols unterzog. Er gibt einen kurzen Überblick über 27 von ihm wegen Nierensteinen operierte Fälle.

REFERENCE

Lowsley, O. S., and Bishop, C. C.: A New Method of Repairing Kidney Wounds, Surg., Gynec. & Obst. 57:494, 1933.

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Radical Operation in the Treatment of Tumors of the Testicle

LLOYD G. LEWIS, M.D., F.I.C.S., D.A.B.

WASHINGTON, D. C.

IN my opinion, radical operation is indicated for all operable malignant radioresistant tumors of the testicle. Seminoma or germinoma is a relatively benign, radiosensitive tumor, and my statistical analysis shows that the advantage of radical operation for seminoma is not more than 1.5 per cent, which is not significant. If the seminoma cell were the parent cell for a teratoid testicular tumor one would expect a relatively high percentage of nongerminomatous metastases from patients with apparently pure seminoma. Friedman stated that he had observed 4 germinomas with nongerminomatous metastases, studied by the "multiple block method," which proved to be pure germinomas. One must be very careful in the diagnosis of "pure germinoma," but if Friedman is right, the incidence of nongerminomatous metastasis from seminoma is not more than 1 per cent. I have never observed nongerminomatous metastasis from a "pure seminoma." The cure rate for seminoma treated by simple orchiectomy and irradiation should be about 95 per cent. The only patients with seminoma in my series who died from metastasis had advanced disease, with metastases so widespread that irradiation could not be carried out fast enough to keep up with the tumor. The wide publicity given testicular tumors since the end of World War II has markedly reduced the incidence of advanced testicular tumor. I do not hesitate to perform a radical operation when the patient presents himself with any testis tumor intact, but most of my patients are referred after simple orchiectomy and adequate pathologic study have been carried out; therefore, in the case of seminoma, I do not consider myself justified in advising secondary resection of the retroperitoneal nodes and spermatic cord for what is apparently "pure seminoma."

The relatively simple classification which I shall use in the discussion of radical surgical intervention for tumors of the testis is based upon the most malignant element of the tumor. A classification based on teratologic elements does not offer a basis for prognosis. The term "adult teratoma" or "mature teratoma" implies a benign tumor, but 36 per cent of patients with so-called adult teratoma in my series have presented metastases. Adult teratoma, therefore, should be classified under the heading teratocarcinoma, a tumor of more or less adult structure, with a malignant element that is not chorionic tissue. The tumors of the 4 patients with apparent adult teratoma who had metastases have been classified as teratocarcinomas, leaving 7 under the heading "mature teratoma." Adult structure in the teratoid portion of a tumor mixed with chorionic tissue is very rarely observed. The reason for this separate classification, teratocarcinoma, is that the prognosis is better than for chorionic cancers.

Tumors of cytotrophoblast, generally in the form of papillary or villus adenocarcinomas, occur without evidence of somatic tissue. These tumors are highly malignant and metastasize more rapidly and more

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frequently than do tumors composed of cystotrophoblasts with embryonic or mature teratoid tissue, which I have called teratotrophocarcinoma.

When the cytotrophoblast matures into a syncytiotrophoblast, the lesion is choriocarcinoma or chorioepithelioma, which is the most malignant tumor known. It may occur in practically pure form but is more frequently associated with embryonic teratoid tissues in the form of teratochoriocarcinoma. It is apparent that the function of chorionic tissue is to invade blood vessels under normal circumstances, and these tumors do invade blood vessels, so that a tumor composed of syncytiotrophoblasts like chorioepithelioma, regularly metastasizes by way of the blood stream. Experience shows, however, that the cytotrophoblast, although apparently it invades blood vessels, is prone to metastasize to the retroperitoneal lymph nodes. It is rarely possible to cure a patient with chorioepithelioma by any means, but I have a series of patients apparently cured by radical operation even with metastatic involvement from cytotrophoblasts. The chorionic gonadotrophin observed in the urine from patients with tumor of the testis is derived from the cytotrophoblast and the tests have given consistently positive results in all of the cases in the series. The tumors were classified as trophocarcinoma or teratotrophocarcinoma. The aforementioned cells are always present in choriocarcinoma; therefore, tests for gonadotrophic hormones give positive results in the presence of chorioepithelioma as well as in that of trophocarcinoma. There has been some question as to the origin of the gonadotrophic hormone observed in the urine of patients with trophoblastic cancer. Some have expressed the opinion that the tumor stimulates the production of gonadotrophic hormone from the pituitary, but recent observations on 2 patients with trophoblastic cancer seemed to indicate that it originates from the tumor itself. In the case of 1 patient, a physician 35 years of age, there were 2 positive results from Aschheim-Zondek tests prior to orchiectomy. After simple orchiectomy there were 2 more positive Aschheim-Zondek reactions. Radical surgery operation was performed, with removal of a 3 cm. node at the left renal pedicle. The results of the Aschheim-Zondek tests became negative and remained consistently so from the first through the fourth postoperative day. With a second patient with chorionic cancer, 4 positive results were obtained on four days prior to the operation. For three days immediately after the radical procedure the Aschheim-Zondek tests gave negative results. If this gonadotrophic hormone were produced by the pituitary under the stimulation of the tumor, one would not expect the hormone to disappear from the urine within twenty-four hours after the operation.

There were inoperable retroperitoneal metastatic nodes in 12 cases of radioresistant tumor. They were considered inoperable because of their large size, because of the position of the nodes involved or because of involvement of the great vessels. In this group there was 1 teratoadenocarcinoma. There were 3 teratochoriocarcinomas, 2 trophocarcinomas and 6 teratotrophocarcinomas. All of the patients have died, and all showed metastasis; 1 of the group died as a result of irradiation, but extensive metastasis was demonstrated at autopsy.

In 8 cases radical operation failed. The nodes were apparently cleanly removed, but 5 patients died of metastases and 2 of the effects of roentgen therapy. One was followed for five years but has not been heard from since 1951. In all of these cases the tumors were trophoblastic carcinomas.

There were 17 cases of metastatic cancer apparently cured by radical surgical

intervention In this group there were 2 adenocarcinomas without evidence of trophoblastic element or teratoid structure There were 3 patients with teratocarcinomas, 7 with teratotrophocarcinomas, 3 with trophocarcinomas, 1 with teratochoriocarcinoma and 1 with choriocarcinoma The last-mentioned patient is the only one with metastatic syncytium living, after any type of operation or irradiation, in this series A tremendous metastasis occurred in a man 50 years of age, in whom the original testicular tumor developed in 1940 It was called an adult teratoma In 1942, metastasis was treated unsuccessfully by irradiation In 1950 he underwent further irradiation, and in 1952 I removed a metastatic mass weighing 13 pounds (5 9 Kg) I include this case because the patient with a long-standing tumor that metastasized early, is apparently well more than three years after radical surgical intervention

To sum up, there were 62 patients with advanced inoperable lesions All have died of metastasis There were 37 patients from whom retroperitoneal metastatic nodes were removed Nineteen are living, 18 of them for more than five years and 1 for three years Three have died of excessive irradiation and 15 of metastasis It is interesting to note that the 3 patients who died of irradiation from one and a half to two and a half years after operation showed no tumor at autopsy Of the 73 patients who had no evidence of retroperitoneal metastasis, 53 are living, 7 died of excessive irradiation and 13 died of metastasis In this series of 172 radioresistant tumors there were 14 chorioepitheliomas, 17 teratochoriocarcinomas, 31 trophocarcinomas and 65 (the largest group in the series) teratotrophocarcinomas There were 12 cases of undifferentiated adenocarcinoma and 26 of teratocarcinoma, leaving only 7 in the group designated "adult teratoma" in which the patients survived five years or more without metastasis The rate of cure for choriocarcinoma or chorioepithelioma is plus or minus 0, and radical operation offers no great advantage for this type of cancer, but when syncytium is mixed with teratoid elements there is a chance, and 2 of the 3 patients from whom metastases were removed are living, although the survival rate for the entire group of 17 patients is only 18 per cent On the other hand the cure rate for apparently pure trophoblastic cancer, sometimes called cytotrophoblastoma, is 29 per cent, and when this trophoblastic tissue is mixed with teratoid elements the survival rate goes up to 40 per cent Eight of the 12 patients with adenocarcinoma survived for more than five years, and 18 of the 26 patients with teratocarcinoma have survived for five years All of the patients with apparently pure adult teratoma have survived for five years, but I do not put any stress on this figure, for statistical purposes, it would be better to include teratoma in the group with teratocarcinoma, but for prognostic purposes it is well to keep it in a separate category The advantage of radical operation for the entire group of radioresistant tumors with metastasis is 22 per cent whereas the advantage for radical operation for chorioepithelioma is plus or minus 0 The advantage of radical operation increases as the malignancy of the tumor decreases

The cure of cancer depends upon an early diagnosis, the type of cancer present and adequate therapy For seminoma, in my opinion, adequate surgical treatment consists of simple orchiectomy followed by adequate irradiation, but for all teratoid tumors of the testis a radical operation seems to be indicated

SUMMARY

The author evaluates radical surgical intervention for testicular tumors, ex-

pressing the opinion that it is indicated for all operable malignant radioresistant tumors in this category. He offers a classification of such tumors, based upon the most malignant aspect of the lesion, and reports briefly on a series of patients apparently cured by radical operation even in the presence of metastatic involvement. Simple orchiectomy followed by irradiation, he states, is adequate for seminoma, but all teratoid testicular tumors should be treated by radical intervention.

RIASSUNTO

L'autore tratta la terapia chirurgica radicale dei tumori del testicolo, esprimendo l'opinione che essa sia necessaria in ogni caso di neoplasia radioresistente e operabile. Propone, inoltre, una classificazione di questi tumori, basata sugli aspetti più maligni di essi, e riferisce brevemente su una serie di malati apparentemente guariti in seguito all'intervento radicale anche in presenza di metastasi. La semplice orchiestomia, seguita da irradiazione, può essere sufficiente per il seminoma, mentre tutti gli altri teratomi del testicolo devono essere trattati con un intervento radicale.

RÉSUMÉ

L'auteur fait une évaluation du traitement chirurgical radical des tumeurs testiculaires, estimant que celui-ci est indiqué dans tous les cas de tumeurs malignes radio-résistantes opérables. Il présente une classification de ces tumeurs, basée sur l'aspect le plus malin de cette lésion; il donne un bref aperçu d'une série de cas apparemment guéris par l'opération radicale, même lors de complications métastatiques.

L'auteur pense que l'orchi-ectomie simple, suivie d'irradiation, est indiquée dans les cas de séminomes, mais que toutes les tumeurs tératoïdes du testicule devraient être traitées par l'intervention radicale.

ZUSAMMENFASSUNG

Der Verfasser schätzt den Wert radikaler chirurgischer Behandlung von Hodengeschwülsten ab und vertritt die Ansicht, dass ein solches Verfahren für alle operablen bösartigen bestrahlungsresistenten Geschwülste dieser Klasse angezeigt ist. Er schlägt eine Einteilung dieser Tumoren vor, die sich auf die Eigenheiten höchster Malignität der Erkrankung stützt, und berichtet in Kürze über eine Reihe von Kranken, die sogar beim Bestehen von Metastasen durch radikale Operation offenbar geheilt wurden.

Er bemerkt, dass die einfache Hodenresektion mit anschliessender Bestrahlung sich für das Seminom eignet, während alle teratoiden Hodengeschwülste radikaler chirurgischer Behandlung unterzogen werden sollten.

SUMARIO

O autor faz uma avaliação da intervenção cirúrgica radical para tumores testiculares, sendo de opinião que é indicada para todos os tumores rádio resistentes malignos operáveis, dessa categoria. Faz uma classificação de tais tumores, baseada nos aspectos mais malignos dessa lesão e faz um relatório ligeiro de uma série de pacientes aparentemente curados pela operação radical, mesmo na presença de metástases.

Declara que a simples orquiectomia acompanhada pela irradiação é adequada para o seminoma, mas todos os tumores testiculares teratoideos devem ser tratados pela intervenção radical.

Volvulus of the Spermatic Cord, Caused by an Embryonal Anomaly

H. D. KOEHLER, M.D., AND R. P. KOEHLER, M.D.

HAIFA, ISRAEL

ANOMALIES of the urogenital system are very common deformities. We operated on a patient with an anomaly we could not find described in the literature. Therefore we consider this case worth reporting.

REPORT OF CASE

On April 18, 1954, J. S., a Druze child 1½ years old, was admitted to the hospital. One week earlier there had appeared a swelling of the right testicle and edema of the scrotal skin. The general condition was satisfactory. Routine examination showed no particular pathologic change. Torsion of the right testicle was diagnosed, and operation, with general anesthesia, was immediately performed. Hemorrhagic exudate was observed in the scrotal sac, which was a *single* cavity, without separation into two parts by a septum. The right spermatic cord, the epididymis and the testicle were normal. From the left inguinal ring, however, descended two completely separate masses. The internal or medial mass appeared to be the left spermatic cord and a small testicle. This spermatic cord was dark blue and circumrotated 160 degrees around the right spermatic cord (Fig. 1). The external or lateral mass coming out of the left inguinal ring was of normal color. Both left masses were removed directly on the inguinal ring, and the inguinal canal was closed by suture (Fig. 2).

Pathologic Examination (Dr. Naftalin).—Specimen A consisted of a testicle 2 by 1.5 cm. and an epididymis 1.5 by 0.7 cm. with a spermatic cord 3 cm. long and 1 by 0.25 cm. in diameter. The testicle was grey in the distal 1 cm and hemorrhagic in the upper 0.5 cm. The hemorrhage extended into the epididymis and into the cord, nearly to the proximal end of the specimen. The cut surface of the structures was similar to their outward appearance

Specimen B was a mass of tissue measuring 3 by 2 by 1 cm. and resembled a cord 2 cm long and 0.2 cm. in diameter. The cut surface of this mass was white, with fine areas of hemorrhage.

Histologic Picture.—Specimen A The testicle was necrotic, but it could be seen that the parenchyma was atrophic, like that of a cryptorchic testicle. The interstitial tissue was edematous and infiltrated with polymorphs and red blood cells. The upper part of the testicle and the epididymis were so filled with blood that no histologic details could be made out. The cord was also infiltrated with blood

Specimen B: The second mass of tissue was fibromuscular, containing large thick-walled muscular blood vessels and edematous tissue containing thin-walled blood vessels This tissue was infiltrated with polymorphs and histiocytes. Around the smaller blood vessels there were infiltrations with lymphocytes. This tissue had the appearance of granulation tissue. In the center of the mass there was a large slitlike duct lined with epithelial cells, resembling those of the ductus deferens (Fig. 3). The subepithelial tissue is composed of cells with little cytoplasm and ovoid nuclei The structures are surrounded by fibromuscular tissue. The smaller mass consisted of edematous tissue and many-walled blood vessels with and without muscular walls. There was also a structure consisting of spaces lined with cuboidal and columnar epithelium, resembling epididymis. The area of juncture between the larger and smaller masses of Specimen B contained blood vessels and a structure resembling ductus deferens in an edematous stroma infiltrated with inflammatory cells. The mass appeared to be a small piece of epididymis and ductus deferens, associated with a hyperplastic pampiniform plexus and muscle bundles in an edematous stroma. No testicular tissue was observed in Specimen B.

From Elisha Hospital Haifa

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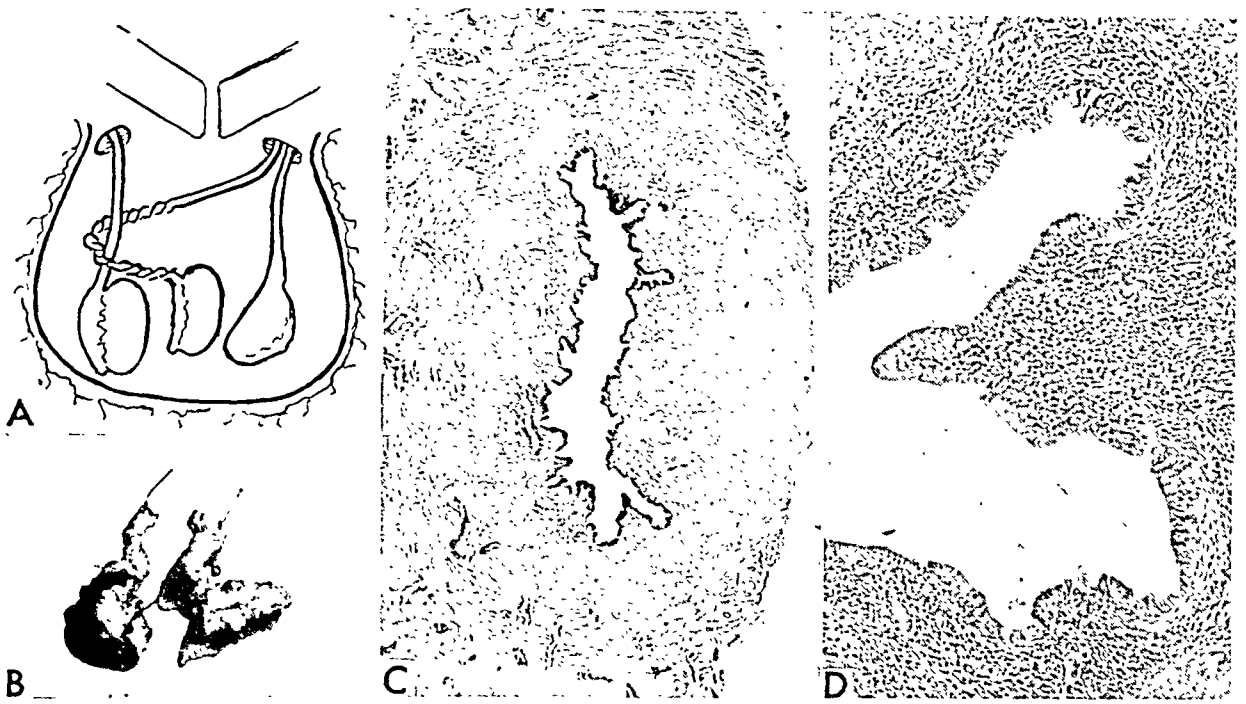

A, schema depicting anatomic situation. *B*, masses removed, showing (a) left spermatic cord and testicle and (b) supernumerary spermatic cord. *C*, low power photomicrograph of supernumerary ductus deferens; *D*, high power photomicrograph of the same.

COMMENT

The specimens showed (1) volvulus of the left spermatic cord around the right spermatic cord in a single ventricular scrotum without a septum, and (2) a left-sided supernumerary spermatic cord and epididymis. Though a third testicle was not detected on the histologic examination, it is most probable that tissue of a third testicle had also developed, because of a third spermatic cord and a third epididymis, and had perhaps been overlooked or lost during the operation. This anomaly of the genitalia is explained by the embryonic development. The external genitalia arise from primordia located on the ventral surface of the body. This area is bisected by a cloacal membrane. By the 8 mm. stage this membrane is divided into a cranial and a caudal portion. These lie in grooves called the urethral groove and the anal pit. The urethral groove bisects the genital tubercle. Laterally the margins of the urethral groove constitute the urethral fold, which forms the external orifice of the urogenital sinus, called in this part pars fallica of the urogenital sinus. The urogenital fold bisects the scrotal swellings. These swellings are the origin of the scrotum. At the 38 to 45 mm. stage of embryonic development the urogenital folds fuse to constitute the penal and scrotal raphe.

In the literature, no case of only a supernumerary spermatic cord and epididymis could be found. According to Campbell, 19 cases of polyorchidism have been reported. In these cases the supernumerary testicle showed abnormalities, e.g., torsion of the spermatic cord, which Jordan and Kindred explained as due to doubling or transverse division of one or both genital folds, oftener on the left side than on the right. Hossein Goldji reported about 24 cases of polyorchidism. According to him, embryologically persistence of the upper portion of the mesonephric tubules, dissociation of efferent and seminiferous tu-

bules of the testicle to two different groups, seem to be responsible for the anomaly In 62 5 per cent of the cases it was left-sided In almost all the anomalous tissue was rudimentary and showed signs of degeneration

SUMMARY

A case of volvulus of the spermatic cord in a single ventricular scrotum, combined with a supernumerary spermatic cord and epididymis, is reported This anomaly is developed between the fourth and the sixth week of fetal life

ZUSAMMENFASSUNG

Es wird ein Fall von Volvulus des Samenstranges in einem einzelnen ventrikularen Hodensack, kombiniert mit einem uberzahligen Samenstrang und Nebenhoden beschrieben Diese Anomalie entsteht zwischen der vierten und sechsten Woche des fotalen Lebens

RÉSUMÉ

Nour presentons un cas de volvulus de la corde spermatique chez un enfant age d' un an et demi Le volvulus fut origine par une anomalie embryonnaire qui si developpait depuis la quatrieme jusqu'a la sixieme semaine de la vie foetale Une corde et une epididyme surnumeraires existaient

RIASSUNTO

Viene descritto un caso di volvolo della córda spermatica in uno bambino di un anno e mezzo, con una corda e uno epididimo addicionale Il volvoloe risultato da una anomalia embriologica Questa anomalia si svolge dalla quarta fina sesta settimana della vita fetale

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The learned and ingenious Doctor Christopher Wren did propose in the University of Oxford to that noble benefactor of experimental philosophy, Mister Robert Boyle, Doctor Wilkins, and other deserving persons, that he thought he could easily contrive a way to conveigh any liquid thing immediately into the mass of blood, vide by making ligatures on the veines, and then opening them on the side of the ligature toward the heart, and by putting into them slender syringes or quills, fastened to bladders (in the manner of clysterpipes) containing the matter to be injected, performing that operation upon pretty big and lean doggs, that the vessels might be large enough and easily accessible

—*Samuel Pepys*

Neurologic Surgery

Tic Douloureux

COLLIN S. MACCARTY, M.D., F.A.C.S., F.I.C.S., D.A.B.

ROCHESTER, MINNESOTA

"THIS painful affliction of the face so aptly called tic douloureux by Nicolous Andre of France in 1756 has been known for centuries. Avicenna (1000 A.D.) is said (cf. Krause's book) to have described it accurately. Fothergill of England (1773) gave such an accurate description of the malady that it has at times been unfairly called Fothergill's neuralgia. However, not until the first quarter of the Nineteenth Century was it known to be an affliction of the trigeminal nerve. The most important physiologic experiments of Sir Charles Bell of England and Magendie of France, almost simultaneously (1821) demonstrated that the trigeminal nerve, and not the facial, supplied sensation to the face. It was, however, much later that tic douloureux was recognized as an entity of the trigeminal nerve. Even Bell considered the pain to be of sympathetic origin and considered the possibility of relief by sectioning the sympathetic trunk, and until nearly the middle of the Nineteenth Century the old method of cutting the facial nerve had not yet disappeared."[1]

In 1891 Hartley first sectioned the peripheral branches of the nerve, thereby producing sustained temporary relief from tic douloureux.[2] Krause in 1893[3] performed the first successful removal of the gasserian ganglion. Spiller and Frazier perfected posterior root section, with preservation of the ganglion and motor root, and pointed out the advantages of differential section of the posterior root. Their first case was reported in 1901.[4]

Sjöqvist in 1938[5] showed that sectioning of the descending root of the fifth nerve in the medulla will relieve trigeminal pain and yet assure preservation of the sensation of touch in the face, though with loss of pain and sensation of temperature.

Shelden and his associates[6] in the summer of 1951 decompressed the second and third divisions of the nerve by enlarging the foramina rotundum and ovale.

Taarnhøj[7] of Denmark in 1952 introduced a method of decompressing the sensory root of the nerve for the treatment of trigeminal neuralgia. This procedure had many appealing features, and consequently was immediately accepted and tried in many centers throughout the United States.[8]

Recently, several other procedures have been done—such as injection of the ganglion with hot water,[9] neurolysis of the ganglion,[10] injection and division of the greater auricular nerve and occipital nerve and compression of the ganglion.[11]

Diagnosis.—Trigeminal neuralgia is characterized by intermittent attacks of severe, lancinating facial pain, the pattern of which is confined to one, two or all three of the sensory components of the trigeminal nerve. The pain usually is induced by stimulation of "trigger zones" in the mouth

From the Section of Neurologic Surgery, the Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

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or face It occurs most frequently in the mandibular division of the nerve [1] The pain begins abruptly, lasts for a moment to a few minutes, and stops precipitately Between attacks the patient is free of pain Rarely, the attacks may last for an hour or more The attacks may occur with such frequency as to seem to be almost continuous, and may last for days or weeks They often are precipitated by talking, eating, shaving or by a cool breeze blowing across the face In about 2 to 5 per cent of cases the disease may be bilateral [12]

Examination of the patient in a typical instance reveals no objective neurologic defects

Causation —The cause of typical trigeminal neuralgia is unknown It may, however, occasionally be observed as a symptom of tumor of the cerebellopontine angle or the middle fossa, or of a vascular anomaly [1] The coincidental occurrence of this disease with multiple sclerosis is of more than passing interest [13] The typical pain of this disease also has been reported as appearing secondary to compression of the peripheral branches by neoplasms [14] However, the disease as ordinarily seen has no known cause

Incidence —The disease occurs as often in men as in women, as reported in several large series It occurs in patients beyond the age of 50 years in 70 to 80 per cent of the cases [15]

Treatment —My associates and I have found no satisfactory method for the permanent relief of trigeminal pain, short of operation No sustained relief has been obtained by the inhalation of trichloroethylene, or the use of large doses of vitamins B, or B_1 ,[16] and we have viewed the use of stilbamidine therapy[17] during the past two and one-half years with waning enthusiasm The excruciating and debilitating neuritis frequently observed after the use of this drug has discouraged us from utilizing it against this disease, particularly since the condition can be effectively and permanently relieved by operation

When a patient with typical tic douloureux of the fifth cranial nerve appears, we usually advise the trial of one or two peripheral nerve blocks with alcohol before suggesting surgical intervention We do this to show the patient that the pain can be relieved without disfigurement Such a nerve block also is done to demonstrate anesthesia of the face to the patient In my experience, a patient with trigeminal pain usually welcomes the anesthesia as a substitute for the pain If, however, he does not prefer to exchange loss of pain for anesthesia, then interruption of the posterior root of course should not be advised

The definitive therapy of trigeminal neuralgia therefore focuses itself on surgical operation This consists of total sectioning of the posterior root, but with sparing of the motor root, or subtotal section or bulbar trigeminal tractotomy or one of the more recent procedures such as decompression of the posterior root, the second and third divisions, or performance of some form of ganglionlysis The only certain way to relieve pain is to section the posterior root The resultant anesthesia is an undesirable but necessary sequel

We have had considerable experience with both total and subtotal sectioning of the posterior root, as well as with the decompression operation Our experience with bulbar trigeminal tractotomy has been limited, but on the recommendation of those whose judgment we respect and who have tried the procedure extensively, we have abandoned it generally as too dangerous and too uncertain We feel it might be done only in the presence of bilateral trigeminal neuralgia, and that in this condition it would be done on one side, so that preservation of touch on the side of the tractotomy would permit normal intake of food As White and Sweet[17] have si-

gested, the operation might also be done for a patient affected by the "onset of pain or a trigger zone in the first division in a relatively young or vigorous person, or in one whose eye on the other side is blind. The persistence of an effective corneal reflex is of special value in such people."

Where do we now stand with regard to the relief of trigeminal neuralgia? In 1954 Love and Svien, of the Mayo Clinic, reported on 100 cases of decompression of the posterior root.[18] Fifty-eight of the patients obtained relief, 31 had pain which seemed characteristic of trigeminal neuralgia, and the condition of 11 was indeterminate. It was apparent that as time elapsed after the surgical procedure there were more recurrences of pain. At present the decompression operation is rarely advised, and few if any surgeons expect the procedure to provide permanent relief of the condition.

In certain selected instances, however, decompression might still be worth a trial —for bilateral trigeminal neuralgia in young, vigorous persons who are willing to risk multiple surgical procedures to avoid facial anesthesia; or for persons who are blind in the eye opposite the facial pain and do not wish to accept the 3 to 4 per cent risk of the development of iritis or keratitis in the remaining functioning eye.[15]

There has been a reversion to posterior root section in most instances. Some perform this in the form of subtotal section, sparing the upper fibers to prevent anesthesia of the cornea in patients whose disease is confined to the lower areas of the face. Total section is done for those who have pain in the first division of the nerve.

In a recent communication Dr. C. Hunter Shelden[19] wrote that he and his associates have performed compression of the posterior root fibers in 56 cases since 1953. He added, "Thus far we have had complete relief of pain in every instance and have had no recurrences." Because of this remarkable record, we have decided to offer the procedure to interested patients in the hope that some permanent remission of pain can be obtained thereby without the production of facial anesthesia. We are skeptical, however, as is Dr. Shelden, of the theory that all patients will remain permanently free from pain as a result of such a procedure.

Results of Posterior-Root Section.— Adson in 1926 reported 387 cases from the Mayo Clinic.[12a] In these, 3.4 per cent of the patients had keratitis or iritis; 7.2 per cent had transient facial paralysis; 0.5 per cent had ocular palsy. Craig[12b] in 1941 reported 434 cases from the same clinic. The operative mortality rate was 1.9 per cent, and the recurrence rate was 3 per cent. In other series the incidence of postoperative paresthesias has been approximately 3 per cent.[15]

CONCLUSION

It would seem that posterior root section, which offers approximately 97 per cent relief of pain and is associated with a mortality rate of less than 2 per cent and rarely with undesirable reactions, is still the most reliable and effective method of relieving tic douloureux, a serious and debilitating condition. The author, however, expresses the opinion that the gangliolysis procedures and compression procedures of the posterior root are worthy of further investigation.

CONCLUSIONS

Le tic douloureux est une affection sérieuse et débilitante. Il peut sembler que la section radiculaire postérieure (soulagement dans environ 97% des cas, taux de mortalité inférieur à 2%, complications rares) en soit toujours le mode de traitement le plus sûr et le plus efficace. L'auteur estime pourtant que les techniques de

ganglıolyse et de compressıon de la racıne postérieure meritent une attentıon plus approfondie

SCHLUSSFOLGERUNGEN

Es scheınt, dass zur Behandlung des Tıc douloureux, einer ernsten und aufreibenden Erkrankung, dıe Durchschneidung der hınteren Wurzel, dıe ın etwa 97% dei Falle zur Befreiung vom Schmeiz fuhrt, eine Sterblichkeit von weniger als 2% aufweist und nur selten mit unerwunschten Nebenerscheinungen verbunden ist, noch immer dıe zuverlassigste und wirksamste Methode darstellt Der Verfasser gibt jedoch der Meinung Ausdruck, dass dıe Verfahren der Ganglıolyse und der Kompressıon der hınteren Wurzel weiterer Studien wert sınd

CONCLUSIONI

Sembra che la sezıone della radıce posteriore, ıntervento che fa scomparire il dolore ın circa il 97% dei casi e che è accompagnato da una mortalita ınferiore al 2%, sia ancora il piu efficace metodo di cura dei tic dolorosi

L'autore, tuttavia, è dell'opinıone che la ganglıolisi della radıce posterıore sia tema degno di ulterıori ricerche

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Surgical Relief of Pain

FRASER B. HAMILTON, M.B., M.D., F.R.C.S. (Can.), F.I.C.S.

IN this paper I wish to present an outline on the surgical relief of pain in a rather large group of unrelated diseases. The pain in each condition is responsible for a great deal of disability and morbidity. It is my thesis that the duration of disability can be greatly shortened if the diagnosis is promptly made and appropriate surgical treatment instituted.

It has been my experience that the commonest factor in the difficulties related to these diseases is lack of acquaintance with the condition responsible for the disabling pain. I should like to consider, therefore, some of these somewhat rare but interesting syndromes.

1. *Temporal Arteritis. — Symptom:* Acute continuous pain in the distribution of the temporal artery.

Sign: Tenderness along the course of the artery, temporarily but completely relieved by local infiltration of the area around the artery with 3 cc. of 2 per cent procaine hydrochloride.

Treatment (for permanent relief) : Surgical excision of 1 inch (2.5 cm.) of the artery through an incision inside the hairline.

Four patients coming under my care had all been treated with anodynes for headache over more than six months. All had been incapacitated to the point of being unable to work regularly.

2. *Scalene Syndrome.*—This is not uncommon. The syndrome was first described by Nafzigger. It is remarkable because of the development of pain in the upper extremity. There may be associated motor and pseudomotor signs. The symptoms are caused by compression of the lower trunk of the brachial plexus by a taut anterior scalene muscle. In some 85 per cent of my cases the patients have been women between the ages of 25 and 40.

Symptoms: Pain along the inner border of the arm, radiating to the little finger; motor weakness; excessive sweating.

Signs: Local tenderness over the point of insertion of the scalene muscle on deep pressure, which also aggravates the symptoms.

Treatment: Section of the scalene muscle at its point of insertion (Adson). Twenty-eight of my 32 patients have been successfully treated.

3. *Calcinosis of the Subdeltoid Bursa.*—*Symptoms:* a. Sudden onset of severe pain in the shoulder and inability to move the shoulder without exquisite pain. b. Local tenderness over the appropriate cuff tendon. c. Diagnostic deposit of calcium in the region of the bursa on roentgen examination.

Treatment: Small transverse incision with splitting of the deltoid, opening of the bursa and evacuation of material resembling toothpaste. (Relief is immediate and has been permanent in 56 cases.)

4. *Painful Epicondyle (Tennis Elbow).*—*Symptoms:* 1. Severe pain radiating from the internal epicondyle of the humerus into the forearm. 2. Inability to use the arm in gainful occupations.

Signs: Acute tissue tenderness to the tip of the epicondyle. (Roentgenograms usually reveal no abnormality.)

Treatment: Mobilization of the point of origin of the extensor muscle from the epicondyle and its complete removal with bone forceps. (Eighteen patients have been successfully treated by this method.)

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5 *De Quervain's Disease (Stenotic Tenovaginitis of the Extensor Muscle) — Symptoms* Pain in the region of the styloid process of the radius, aggravated by adduction of the thumb (Frankenstein)

Signs Tenderness over the lower end of the radius, negative results from roentgen examination

Treatment Section of transverse carpal ligament over the involved ligament This provides complete and permanent relief

6 *Slipping Rib —Symptoms* Acute episodes of epigastric pain, not related to meals but associated with bending Roentgenograms of the gallbladder, stomach, kidney and spine are usually normal

Sign The ninth costal cartilage can be grasped between the fingers and twisted, producing acute pain

Treatment Excision of the involved costal cartilage and rib

7 *Genitofemoral Causalgia — Symptoms* Hyperesthesia and paresthesia occurring in the inguinal region, the vulva and the inner side of the thigh after a previous pelvic operation The area involved is very sensitive to the touch of clothing and bedclothing

Treatment Excision of the genitofemoral nerve through an extraperitoneal muscle-splitting incision

8 *Osteoarthritis of the Hip — Symptoms* Painful ambulation, also pain that interferes with sleep

Treatment Diagnostic block of the obdurator nerve on the involved side The patient then walks around for one hour If the pain is relieved, the patient is advised to undergo intrapelvic obdurator neurectomy

9 *Osteoid Ostroma —Symptoms* Acute persistent pain anywhere in the body, aggravated by movement (First described by Jaffe in 1935)

Signs On physical examination, usually none Roentgen study reveals a sclerosing lesion of the involved bone with a small radiolucent area in its central portion

Treatment Surgical excision of the small nidus This brings complete relief

10 *Glomus Tumor —Symptoms* Severe pain related to any extremity

Sign A small pinpoint area can be located with the tip of a probe over the skin of arm, leg or nail

Treatment Local excision of elliptic area containing glomus tissue

11 *Intermittent Claudication — Symptoms* Cramps in the leg muscles on walking

Signs Loss of posterior tibial and/or dorsal pedic pulsations

Treatment Lumbar sympathectomy

12 *Interdigital Neuroma (Morton's Metatarsalgia) —Symptoms* Acute pain on walking, related to the anterior part of the feet

Signs A localized point of acute pain between the third and fourth metatarsal bones An occasional neuroma suggestive of a pea can be palpated

Treatment Removal of the small neuroma through a dorsal incision

SUMMARY

The author presents a brief but comprehensive resume of the types of pain that are amenable to surgical treatment, including temporal arthritis, the scalene syndrome, calcinosis of the subdeltoid bursa, painful epicondyle, slipping rib, genitofemoral causalgia and several other conditions The surgical treatment applicable to each type of pain is stated

ZUSAMMENFASSUNG

Der Verfasser gibt einen kurzen, aber umfassenden Überblick uber diejenigen Typen des Schmerzes, die chirurgischer Behandlung zugangig sind Dazu gehoren die temporale Arteriitis, [illegible] Skalen

syndrom, die Verkalkung des subdeltoiden Schleimbeutels, die schmerzhafte Epikondylitis, Abgleiten der Rippe, genitofemorale Kausalgie und einige andere Krankheitszustände. Die auf die einzelnen Formen des Schmerzes anwendbare chirurgische Behandlung ist angegeben.

RÉSUMÉ

L'auteur présente un résumé court mais complet des differents types de douleurs qui peuvent être traités chirurgiquement, inclus l'artérite temporale, le syndrome scalenus, la calcinose de la bourse sous-deltique, l'epicondyle douloureux, côte glissante, causalgie génito-fémorale et quelques autres conditions enplus. Le traitement chirurgical indiqué pour chaque type de douleur est expliqué.

RESUMEN

El autor presenta un breve resumen comparativo de los tipos de dolor que son sujetos a tratamiento quirúrgico, incluyendo la arteritis temporal, el síndrome de los escalenos, la calcinosis de la bolsa subdeltoidea, el epicóndilo doloroso, dislocación costal, causalgia génitofemoral y diversos procesos patológicos. Se establece el tratamiento quirúrgico de cada tipo de dolor.

RIASSUNTO

Vengono elencati, in breve ma esaurientemente, tutti i tipi di dolore che possono essere curati chirurgicamente: fra essi l'arterite temporale, la sindrome dello scaleno, la calcificazione della borsa subdeltoidea, l'epicondilite dolorosa, la causalgia genitofemorale rtc.

Per ognuna di queste condizioni viene descritta la cura adatta.

Author's Correction: In the article *Urologic Aspects of Pelvic Phlebography* by Prof. Dr. Arminio de Lalor Motta of Recife, Brazil, which appeared in the May issue of the Journal, the following emendations have been made by Prof. Motta:

On page 578, column 2, line 22, and on page 581, column 2, line 14, "dorsal" should be substituted for "femoral." In the French summary (page 580, column 1, paragraph 2, "sarcome" should be "carcinoma." On page 580, column 1, section 2, the sentence beginning in line 21 should read: "The first attempt at opacification of urine was made in 1923, by School, Rowentry and Southerland in the United States and simultaneously by von Lichtenberg and Rosenstein in Germany and Pecco in Italy." In the illustration (page 579), plate E is inverted.

Plastic and Reconstructive Surgery

Problems of Maxillofacial and Oral Surgery

JOHN HERTZ, M D, F I C S

STOCKHOLM, SWEDEN

As the motto, so to speak, of this work I should like to emphasize what I have said before "We must bear in mind that we are treating, not the morbid condition by itself, but the patient, a human being" These words I have found most appropriate whenever I wished to demonstrate the importance of teamwork between the dentist and the physician

Roughly, I shall divide the whole of this vast area into three large main groups The first comprises problems respecting which the dentist has the most important and most responsible task, the second, problems in which the *physician*—and undoubtedly, in most cases, the *surgeon*—must take upon himself the principal burden of the work and the principal part of the responsibility, the third, problems that make doctor and dentist, so to speak, equal before the task and in sharing the *responsibility*

Turning to the first of these main groups, the one in which the dentist is on the front line, I shall first mention the dentist's central position, and consequent great responsibility, in the whole work of cancer prophylaxis, it requires a most thorough knowledge of the conditions called *precancerous*, i e, those changes in tissues which at any time may assume the character of a malignant tumor, but which, on the other hand, may remain unchanged for a considerable time, especially if irritation can be avoided

The whole problem of irritation has passed into an entirely new phase, since proof has been established that the development of cancer itself passes through two stages The first of these is the change of the normal cell, a latent malignant transformation, "initiation of malignant cell change", the other is the initiation of malignant proliferation itself, "the promotion of malignant cell proliferation" A long period, even decades, may pass between the two phases, once the growth of a tumor has started, however, the significance of the exogenic factor has come to an end and the malignant process continues inexorably It is hardly possible to influence the first phase of this development unless the irritating agent can be removed in time, in that case the process is reversible The initiation of the second phase will often depend on an irritating effect, which may be exceedingly slight—a kind of "trigger effect", that is to say, it is the *cancerogenic effect* that rouses the latent forces and makes them explode in a manifest cancer, and the process is irreversible

These precancerous conditions occur with great frequency in the oral cavity, and they are here extremely easy to examine, for patient and dentist alike Since the oral mucous membrane is extremely sensitive, the patient himself will early detect any changes and seek the advice of his dentist, furthermore, there is the possibility that the dentist, during the patient's regular visits for routine examination, may inspect and palpate the *whole*

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of the oral cavity in a few minutes, without giving rise to any form of cancerophobia (which a physician might easily do). The most important key position the dentist holds is best illustrated by some statistics from the Memorial Hospital in New York (Table 1), where Hayes Martin has demonstrated that 27 to 65 per cent of the patients with various types of oral cancer first sought the advice of their dentists. An account published by the same author, with particular reference to the significance of early diagnosis for the results of treatment, further demonstrates that five-year cures in these cases generally range from 25 to 30 per cent—in the case of cancer of the lip the figure is about 65 per cent. These figures agree with those published in Denmark by Jens Nielsen and in Sweden by Elis Berven (Table 2). Selected "early cases" in which the dentist had suspected cancer, i.e., in which he had shown a "high index of early suspicion," present a very different result. Five-year cures here amount to about 50 per cent for all types of cancer, whereas in the case of cancer of the lips the five-year cures represent 85 per cent of all cases (Tables 3 and 4). I have combined the two tabulations in order to demonstrate the great improvement of the results—approximately 100 per cent. These figures clearly show how central is the position of the dentist with regard to diagnosis and, consequently, to the result, when he refers patients to the surgeon and cooperates with him.

TABLE 1.—*Results of Treatment at the Head and Neck Clinic, Memorial Hospital, New York (Hayes E. Martin)*

	Total Number of Patients	Number of Patients Who First Sought Advice of Dentist, %
Carcinoma gingivae	114	65
Carcinoma palati	106	45
Carcinoma linguae	139	35
Carcinoma buccae	113	35
Carcinoma regionis sublingualis	125	27
	597	207

TABLE 2.—*Results of Treatment of Oral Cancer at Radiumhemmet, Stockholm, Sweden, 1916-1937 and 1938-1947 (Elis Berven)*

	1916-1937 Number	1916-1937 Cure %	1938-1947 Number	1938-1947 Cure %
Carcinoma linguae	406	24.1	252	34.1
Carcinoma regionis sublingualis	69	29.0	19	38.8
Carcinoma mandibulae et gingivae	227	22.9	70	35.4
Carcinoma buccae	213	28.6	49	40.9

The most important of these oral precancerous conditions are the erythroplasias and the leukoplakias, certain atrophic changes associated with the Plummer-Vinson syndrome and the oral decubital ulcer.

Erythroplasia and the leukoplakia must be taken to represent the response of the mucous membrane to certain chronic irritants. Histopathologically (Fig. 1*A*) these conditions manifest themselves by hyperkeratosis, keratinization on the surface, deep downgrowth into the epithelium in the shape of round-bottomed flasks, and cellular polymorphism—all manifestations that distinctly indicate the presence of a precancerous lesion. Clinically the leukoplakias present themselves as sharply delimitated, most often whitish, slightly firm but flexible plaques, which are painless and may become fissured (Fig. 1*B*); the erythroplastic areas, which usually are mixed with the leukoplakic ones, are pink. Here I should also like to call attention to the pigmented nevus, the black birthmark, as it may become the starting point of that extremely malignant tumor, the nevocarcinoma.

Further, the precancerous conditions include certain atrophic changes which are closely related, pathologically and anatomically, to leukoplakia, and which must

TABLE 3.—*Delay in Diagnosis of Oral Cancer in Patients Who Consulted a Dentist Before Consulting a Physician (Head and Neck Clinic, Memorial Hospital, New York, 1949)*

Primate Site of Cancer	Total Number of Cases	Probability of Cancer Recognized by Dentist		Probability of Cancer NOT Recognized by Dentist	
		Number of Cases Percentage	Average Time Between First Seeing Dentist and First Seeing Physician, Weeks	Number of Cases, Percentage	Average Time Between First Seeing Dentist and First Seeing Physician, Months
Gum	68	21(31%)	3½	47(69%)	5
Palate	39	17(44%)	4	22(56%)	13
Tongue	34	16(47%)	4	18(53%)	5½
Mucosa of cheek	27	14(52%)	4	13(48%)	11
Floor of mouth	29	18(62%)	1	11(38%)	5
Total	197	86(44%)	3	111(56%)	7

be assumed to represent the clinical manifestations of Vitamin B_2 deficiency and iron deficiency (sideropenia), which is closely related to the so-called Plummer-Vinson syndrome. This syndrome, which has been most thoroughly studied by Hugo Ahlbom of Sweden, the too early deceased chief of Radiumhemmet in Stockholm, was first described by Plummer in 1914. It occurs with relative frequency in Sweden, especially in Norrland. The patient, who complains of difficulty in swallowing, usually has a typical appearance; he is anemic, thin and edentulous and presents atrophic stomatitis with transverse rhagades at the corners of the mouth; the whole mouth may be puckered up into the so-called carp's mouth; furthermore, there may be a magenta-reddish blue coloring of the inner surface of the cheek, corresponding to the occlusal plane (Fig. 1, *C* and *D*). The changes in the mucous membrane also develop in the mesopharynx and the hypopharynx, extending as far down as the esophagus. It was Ahlbom who demonstrated that this condition is a definite precancerous lesion occurring with great predominance—in 80 per cent of the cases—in women with oral cancer or cancer of the pharynx.

It is most important that the dentist should be familiar with the oral decubital ulcer; for, in addition to making an early diagnosis, it is his task to take charge of the direct prophylaxis when faced with the oral conditions that in this connection may have a cancerogenic effect, namely, broken teeth, the sharp edges of fillings, overhanging jacket crowns and ill-fitting prostheses. All of these are irritants, the morphologic manifestation of which may be the oral decubital ulcer, and this also is definitely a precancerous condition (*Fig. 1E*).

The cancerogenic irritants I have briefly touched upon may be summarized as tobacco and undiluted alcohol, the significance of which in the development of precancerous lesions appears to have been proved by Hayes Martin. Berven of Stockholm and Nielsen of Copenhagen

TABLE 4.—*Percentage of Cures, Head and Neck Clinic (Memorial Hospital, New York, 1949: Hayes E Martin)*

	Percentage Cures (Selected Early Cases)	Percentage of Cures (Total Number of Cases)
Carcinoma labii	86	67
Carcinoma linguae	35	30
Carcinoma commissura oris	50	19
Carcinoma buccae	60	24
Carcinoma palati	37	30
Carcinoma gingivae	38	32
Carcinoma tonsillae	40	29

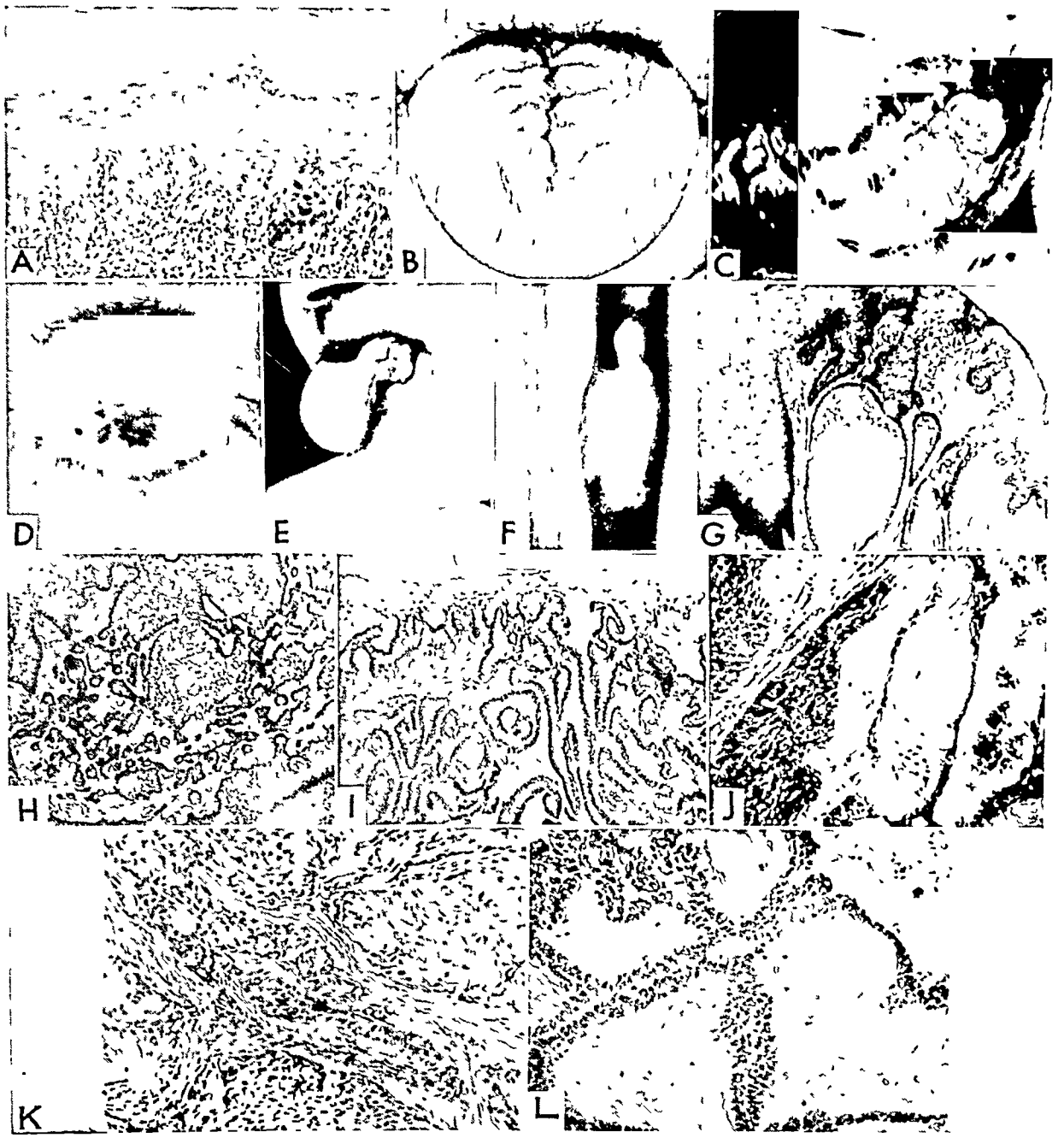


Fig. 1.—*A*, leukoplakia (histopathologic picture). *B*, leukoplakia of the tongue; carcinomatous development in one corner (author's observation). *C*, atrophying stomatitis accompanying Plummer-Vinson's syndrome. *D*, "carp's mouth" (Plummer-Vinson's syndrome). *E*, decubital ulcer with definite carcinomatous development (author's observation). *F*, tibial adamantinoma (John Hertz). *G*, adamantinoma with cyst formation, ×33 (John Hertz). *H*, adamantinoma, ×33 (John Hertz). Note downgrowth of epithelium in enamel organ-like figures, *I*, adamantinoma, ×33 (John Hertz). *J*, photomicrograph of tibial adamantinoma (John Hertz). *K*, adamantinoma invading and destroying bony tissue. Note transformation into osteoid and collagen masses, with beginning penetration of tumor cells between collagenous fascicles, ×72 (John Hertz). *L*, adamantinoma (×100) invading and destroying bony tissue. Note transformation into unmasked protoplasmic areas and collagenous fascicles (John Hertz).

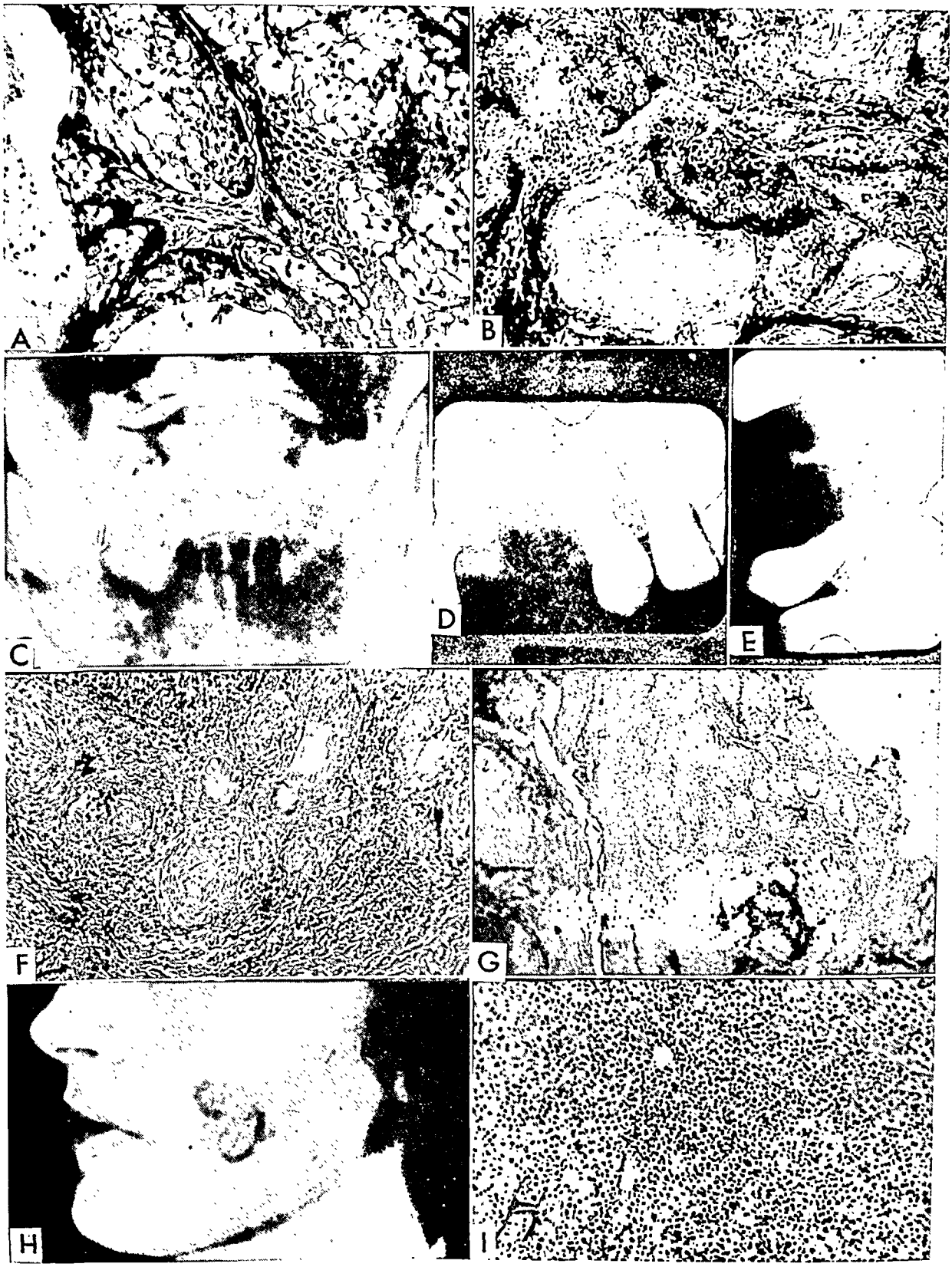
also consider these substances important cancerogenic irritants. Syphilis and other diseases of the teeth and the oral cavity must also be included. Nielsen has mentioned the galvanic current produced by fillings of different materials; differences in potentiality of as much as 0.4 volt have been measured, and it is a definite impression that these potential differences may play an important role. Ariboflavinosis, the Vitamin B_2 deficiency, has been emphasized, as has sideropenia.

All this, however, does *not* say *all* about the role played by the dentist in the prevention of cancer. In the whole of this first, large group the dentist plays an even more active role, participating directly in the treatment of tumors of the jaws; it will fall to his lot to operate on a large number of these tumors. I refer especially to odontogenic cystic growths. In the whole diagnostic approach to a large proportion of all tumors of the jaws the dentist is to be found in the front rank, because the patient first seeks his advice.

As regards cysts in particular, I said, in a fairly large account of adamantinomas from the Radiumhemmet in Stockholm, that "an operation for a dentigerous cyst is not complete unless a microscopic examination of the cyst sac has been performed," and I consider this microscopic examination most important.

Concerning adamantinomas, I noted that 1,509 of 163,655 patients registered at the Radiumhemmet during the years 1921 to 1950 had tumors of the jaws, 31 of which were adamantinomas, i.e., 2 per cent of all tumors of the jaws. Generally 75 per cent of tumors of the jaws are located in the maxilla, but the great majority of the adamantinomas (84 per cent) are located in the mandible. My account included 1 case in which the adamantinoma was located in the tibia (Fig. 1*F*). Many theories have been advanced with regard to the pathogenesis of adamantinoma. Falkson, in 1888, stated that adamantinomas are derived from the enamel organ, whereas Kurt Thoma of Boston has claimed that they may also be derived from supernumerary teeth because the dental arch itself may be complete. Magitot and Norberg expressed the opinion that adamantinomas have been derived from transformed normal supernumerary dental follicles, while one theory, advanced by Axhausen, Cahn and my assistant, Forsberg, claims that they take their origin from simple dentigerous cysts. Extensive histologic studies carried out by myself have now demonstrated the existence of a direct connection between the oral epithelium and the tumorous elements. For this reason I consider it most reasonable to assume that adamantinomas arise through the ingrowth of the oral epithelium, as a homologue of the development of the tooth itself (Fig. 1*G*, *H* and *I*). I have further been able to establish histologically that the tumor tissue invaded and destroyed the surrounding osseous tissue (Fig. 1*J* and *K*). The account of these cases of adamantinoma included a comparison (Table 5) between the results of the treatment and the results of the initial treatment to which the same patients had been subjected; this comparison demonstrated that *"conservative surgery" resulted in recurrence in almost 100 per cent of the cases,* whereas *radical surgical procedures achieved five-year cures in almost 70 per cent of the cases.* The most important feature in the prognosis was the marked tendency to recurrence. Support by irradiation did not alter the result. It was further established that a proper biopsy is one of the most important weapons in early diagnosis and, consequently, in the fight for a satisfactory result.

I may also here mention the extremely rare mucus-secreting epidermoid tumors described by Skorpil, Linell and my which represent only 2.7


A
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C
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TABLE 5.—*Outcome of Treatment**

	Five-Year Cure	*Followed Up Less than Five Years So Far, "Cured"*	*Relapse*	*Relapse, Died from Tumor*	*Died from Operation*	
Radical operation	9	4	1			14
Radical operation + irradiation	6		1 (2)	(1)	1	8 (3)
Conservative operation	3	2	1			6
Conservative operation + irradiation	2		(1)			2 (1)
Irradiation			1	1		2
	20	6	4 (3)	1 (1)	1	32 (4)
	26		5 (4)			

*Outcome of Initial Treatment***

	Five-Year Cure	*Followed Up Less than Five Years So Far, "Cured"*	*Relapse*	*Relapse Died from Tumor*	*Died from Operation*	
Radical operation	5		(1)			5 (1)
Radical operation + irradiation	3		1 (1)		1	5 (1)
Conservative operation		1	16	1		18
Conservative operation + irradiation	1		1 (1)	(1)		2 (2)
Irradiation			2			2
	9	1	20 (3)	1 (1)	1	32 (4)
			21 (4)			

*Numbers in parentheses denote mucus-secreting tumors.
**First treatment of same patients, at Radiumhemmet or elsewhere.

tumors of the jaws. My studies of this kind of tumor, which preponderantly affects women, suggest that its pathogenesis resembles that of adamantinoma. Morphologically, the coexistence of epidermoid cells and the secretion of mucus are the pathognomonic features (Fig. 1*L*); also, this kind of growth destroys the adjacent bone (Fig. 2*A* and *B*). The tumor has a fairly long history, its duration ranging from one to ten years, and it manifests itself as a swelling of the bone; the roentgen picture may indicate anadamtinoma (Fig. 2*C*), but the exact diagnosis can be established only by a biopsy. The dentist is of course not expected or required to make a subtle differential diagnosis; one of the initial symptoms, however, may be toothache, and for this reason the dentist may be the first person consulted. In such cases the possibility exists that he may immediately refer the patient to the surgeon. Should he fail to do so he will delay the treatment, which consists in radical surgical removal.

The dentist will also encounter other diagnostic problems within the pathologic picture and the treatment of tumors. Not only do epulides and giant cell tumors play an important role in the prevention of cancer, they also present interesting diagnostic features; even if the domain of

Fig. 2. (*opposite*).—*A* (× 180) and *B* (× 142) mucus-secreting tumor of the jaw, showing tion of thin bone trabeculae (*A*). *C*, roentgenogram of mucus-secreting tumor of the jaw. *D* roentgenograms showing tuberculosis of the alveolar process (H. Thilander). *F* and *G*, micr picture of alveolar tuberculosis (H. Thilander). *G*, classic actinomycosis. *H*, "atypical actinomy (granulation tissue) described by author.

these tumors cannot be called unexplored, it is far from being adequately mapped out. Giant cell tumors in certain cases are caused by a surgical condition of endocrine origin, which is susceptible to surgical treatment, e.g., hyperparathyroidism caused by hyperplasia or an adenoma in one of the parathyroid glands. Giant cell tumors of this origin have been most thoroughly studied by Hellström of the surgical department of Karolinska sjukhuset, Stockholm. In a series of 23 such cases of hyperparathyroidism he observed that tumors of the jaw were a very early symptom in no fewer than 5; it may even be the symptom that sends the patient to his physician via the dentist. Since then Hellström's material has increased to twice its former size, but the number of tumors of the jaws has remained unchanged. The reason is that the material is selected, and the basis for its selection is another point of view, viz., urologic. An interesting but sad fact demonstrating the great importance of the dentist is that Hellström's account shows that from one to eleven years passed before the diagnosis was definitely made—and that is far too long!

Concerning the epulides and their diagnosis, I shall mention only the fact that the dangerous ones, with their tendency to recurrence after surgical removal, are the ones that have a tendency to expand the interdental spaces and even produce deviation of the adjacent teeth; according to my experience, this never happens in the case of simple granuloma.

It was another Swede, Hugo Ahlbom, who did the pioneer work in another of the large areas in this field, namely, that of the mucous and salivary gland tumors in and around the oral cavity, especially those located in the salivary glands themselves. These mixed tumors are typical of the salivary glands, and their site in the great majority of cases is the parotid gland

TABLE 6.—*Tumors of Mucous and Salivary Glands: Incidence in Various Sites (Radiumhemmet, Stockholm: H. E. Ahlbom)*

Parotid region	177
Submaxillary region	13
Sublingual region	2
Bucca	6
Lip	2
External auditory canal and middle ear	2
Orbit (lacrimal glands)	1
Soft palate	6
Tongue	3
Oropharynx and tonsillar region	5
Hard palate, upper alveolar process, maxillo-ethmoid region and nasal cavity	31
Nasopharynx	1
Larynx and trachea	3
Cutis and subcutis	2
Total	254

(75 to 95 per cent) according to various statistics (Table 6). They may, however, also occur in other locations in the oral cavity; Ahlbom's own account included no fewer than 31 oral tumors of this kind, i.e., 12 per cent of 254 patients had neoplasms belonging to the mucous and salivary gland group (Fig. 1*E*); in Hayes Martin's series of 62 palatinal tumors, 35 per cent were mucous or salivary gland tumors.

The position and responsibility of the dentist in the whole field of cancer prophylaxis, therefore, are most important. Negligence on this point costs dearly and cannot be made up, for as Omar Khayyam wrote in the Rubaiyat,

The moving finger writes; and having writ
Moves on: not all thy piety nor wit
Shall lure it back to cancel half a line,
Nor all thy tears wash out a word of it.

Not only in cancer prophylaxis but in the fight against the chronic specific inflammatory conditions, tuberculosis and (especially) syphilis and actinomycosis, is the dentist on the very front line in diagnostics. He plays an important role; these conditions have lost a great deal of their importance, and so, in some measure, has actinomycosis, a condition the prognosis of which was thoroughly changed when the

use of antibiotics, especially penicillin, were introduced Nevertheless, in order to demonstrate that diagnostic problems still exist as far as tuberculosis is concerned, I shall present some illustrations of an apparently purely dental condition (Fig 2, *D* and *E*) which on microscopic examination turned out to be tuberculous (Fig 2, *F* and *G*) The case was reported by one of my assistants, H Thilander

A number of problems concerning actinomycosis are still far from being sufficiently known outside Scandinavia, where new ground was broken for the bacteriologic classification of the disease by Per Holm, of Statens Seruminstitut in Copenhagen Essentially on the basis of the work carried out by him, new varieties have been added to the "classic" form (Fig 2*H*) described by Langenbeck in 1845 and subsequently, by Israel in 1878 I have never been able to trace Langenbeck's original description, which was that of a case of actinomycosis of the lower jaw, it was, however, cited in detail by Israel In addition to the "classic" form, Per Holm's research work has added the variety that Eiken and Mortens of Denmark have called "atypical actinomycosis," and of which Glahn later collected 94 cases at the University Hospital in Copenhagen Later I, myself, added one more clinical form, which, however, completely fits into the bacteriologic classification outlined by Per Holm I shall, however, not deny that future research may add more types

Per Holm was able to establish, in 1950, the fact that different varieties of ray fungi exist, and that "other microbes" are also present in every actinomycotic lesion in man that contains any such ray fungi Per Holm concluded that neither fungi nor the "other microbes" alone are able to produce morbid conditions in man, whereas when they coexist they become a cause of these lesions Per Holm in 1948 had also demonstrated by experience *in vitro* that indisputably human pathogenic anaerobic strains of actinomyces are sensitive to penicillin in the same degree as are staphylococci For this reason it was considered justifiable to expect that penicillin would have a favorable—perhaps even a curative —effect on actinomycosis A very important feature—emphasized, indeed, by Per Holm himself—was that these experiments did not reveal anything concerning the strength of resistance *in vivo* In 1951 Per Holm arrived at the conclusion that patients with actinomycosis may be treated adequately as far as the actinomycosis is concerned, so that this is killed but without the patient's being cured, and that in some cases the persistence of the condition depends upon the presence of the "other microbes" of actinomycosis, which are able to maintain an already established infection It has *not* been proved, however, that the "other microbes" are able to produce an infection without the presence of actinomycetes The presence of actinomycetes is a *sine qua non*, *Actinobacillus actinomycetem comitans* appears to be responsible for the "continued disease" in many cases of penicillin-treated actinomycosis Per Holm's classification of actinomycetes comprises four groups, to which more may be added in the future Types I and II are said to be responsible for the condition in its "classic" form, Type I being identical with Actinomyces Israel These forms, particularly when thoracopulmonary or abdominal, are fairly resistant to penicillin, the cervicofacial forms yield to it more readily Per Holm* has expressed the opinion that this peculiar feature depends upon anatomic conditions, the location of the infection in the inner organs Types III and IV are considered responsible for the "atypical forms," of which one has been described by Eiken and by Mortens Clinically this form has features similar to ordinary infection in the jawbones—osseous foci, an acute course with suppu-

*Personal communication

tion, a slightly raised temperature, pain, tenderness and fairly early abscess formation. If left untreated it may also take a chronic course with the formation of fistulas. This condition, consequently, in the United States as well as in Scandinavia, is frequently mistaken for an ordinary infection.

In addition to these two there is the form I have described—and if this peculiar terminology is to be continued I might call it "atypical actinomycosis with an atypical course"—which differs essentially in its clinical features. This form is best illustrated by a brief outline of a case that came under my own observation. The patient was a 27-year-old woman who had had a wisdom tooth extracted, after which she had some trouble with the alveolus. A few months later a tumor developed at the base of the mandible; it was removed surgically, and microscopic examination revealed an unspecific granulation tissue tumor (Fig. 2*I*). The tumor recurred and the patient promptly came to me. A roentgenogram gave negative results. I punctured the tumor, giving the needle a long path, and aspirated some material for examination, but before I received the report I had hospitalized the patient and was treating her with large doses of penicillin, 1,200,000 units a day, besides which I administered smaller doses into the tumor itself. The condition subsided in five days, and there has been no recurrence for three years. After treatment had been instituted, Per Holm's confirmation of the clinical diagnosis of "atypical actinomycosis" was received.

This case history indicated, first of all, that the organism had probably been invaded through the alveolus of the wisdom tooth; next, that no foci were present in the bone, and, further, that a biopsy may be insufficient, since microscopic examination even later, after the diagnosis had been established, failed to demonstrate the diagnosis. Moreover, it demonstrates the value of the Per Holm's bacteriologic classification and the prompt and excellent effect of large doses of penicillin. It goes without saying that dentists must be familiar with the "atypical" form; it is among the diseases for which the patient must be hospitalized for treatment by a surgeon, and in its treatment cooperation among the dentist, the surgeon and the bacteriologist is of the greatest importance.

The second of the large domains comprises problems beyond the responsibility of the dentist, including the complications and the treatment of major surgical conditions. Here the physician, and especially the surgeon, has to bear the bulk of the responsibility. The complications include primarily *inflammatory conditions* in and around the tooth organ. Here the chief concern, naturally, is the *surgical* problem, although the conditions that may perhaps be designated as "medical" should by no means be ignored.

Taking for my point of departure a diseased tooth, I shall outline the different courses open to the directly propagating inflammatory process that is not controlled by adequate treatment. The inflammatory process in question may originate in the infected paradentium, apically or marginally, or, say, from the lower wisdom tooth, and, without dealing in detail with figures —I should like to demonstrate the great degree of parallelism that exists between the incidence of caries of the different teeth and that of osteitis originating from the teeth. I have plotted the figures from two different statistics in the same tabulation. Propagation of the inflammatory processes may result in osteitis, diffuse or circumscript, and, in the case of the upper jaw, also in maxillary sinusitis. The further course of osteitis in these cases may differ widely. From the diagram (Fig. 3), one might be rather surprised that, con-

sidering all the complications that may occur, it is possible to survive a diseased tooth! Most frequently the development will result in a subperiosteal abscess—what is called a parulis—which, when it perforates, may cause formation of a fistula, unless it is cured by adequate incision and drainage, or it may become encysted These are fairly commonplace developments. The whole position becomes far more serious if one is faced with a further propagation downward or in a posterior direction, resulting in the much-dreaded and dreadful phlegmons, which descend into the fascial spaces of the neck, following partly the anatomic arrangement and partly the law of gravity. In the earlier times, which I am old enough to have lived through myself, the chances of saving the life of a patient when these propagations set in were extremely small. The difficulties were further increased when laryngeal edema threatened to suffocate the patient, and an expeditious tracheotomy was his only chance. Although there is now, by means of treatment with antibiotics, extensive operations, and the maintenance of fluid balance, a certain—not quite small—possibility of bringing the situation under control, these conditions are still most serious, and, naturally, if developments have proceeded so far, a good deal beyond the competence of the dentist. The patient must be hospitalized and treated by a surgeon, preferably one who has specialized in this particular field. In addition to arising through direct propagation via the lymph nodes, i.e., as adenophlegmons —and it has been a moot point whether all cervical phlegmons are not actually adenophlegmons—the inflammation may, in my opinion, also perforate directly into the spaces with their loose connective tissue. The osteitis may also terminate fatally in another way; death may occur as the result of general sepsis or of thrombophlebitis. The dentist's important and respon-

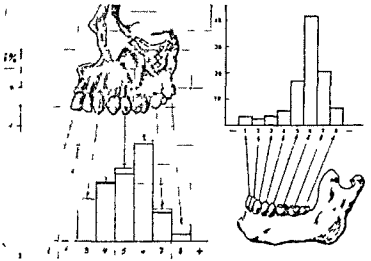

Fig. 3.—Comparison of the incidence of odontogenic osteitis in the maxillae and the incidence of caries. Heavy lines denote odontogenic maxillary osteitis; lighter lines, dental caries.

sibilities in prophylaxis, as by his treatment of the diseased tooth person who, more than anybody else, can contribute to the prevention of these complications.

This second group also includes oral cancer. I shall outline the therapeutic principles in dealing with oral cancer—briefly, these principles are similar to those generally applied in the United States. Three possibilities are open: irradiation, consisting of roentgen or radium therapy; surgical removal of the tumor either by extensive extirpation or by electrocoagulation, and, finally, the two procedures combined. Treatment must include the primary condition as well as the metastases, if any are present. The choice of procedure depends upon the site, the histologic features and the stage of its advancement, as well as upon the general condition of the patient.

Cancer of the lip is generally treated by irradiation with roentgen or radium needles. In Scandinavia this is now estimated to yield five-year cures in approximately 90 per cent of the cases.

Cancer of the tongue is routinely treated preoperatively with teleradium or cobalt, during which treatment the size of the tumor will decrease considerably. When the irradiation reaction has subsided,

which usually takes about one month, electrocoagulation of the remnant of the tumor is performed.

Cancer of the gingiva or the palate is treated by electrocoagulation of the tumor, with immediate implantation of radium needles into the cavity. Postoperative defects must be covered by prostheses.

The prognosis of oral cancer is generally poor—still too poor, although it has improved considerably in recent years, especially because the diagnosis is made earlier; this is of paramount importance. For this reason the report on a biopsy should be received within forty-eight hours; a biopsy made *lege artis* can hardly involve any risk to the patient; but it is a *sine qua non* that treatment can be instituted immediately if microscopic examination reveals malignant disease. Delay may be disastrous. It must therefore be considered the rule that the surgeon who is to operate upon the patient shall also perform the biopsy.

The results at Radiumhemmet, given by Elis Berven, of the treatment of oral cancer in the two periods 1916 to 1937 and 1938 to 1947 are presented in Table 6.

Ahlbom has lucidly demonstrated the superiority of the surgicoradiologic procedure also in the treatment of tumors of the mucous and salivary glands, often with the postoperative application of radium tubes to the cavity itself. It is therefore important that the patient should be referred to the surgeon as soon as possible. With early treatment the prognosis is not too unfavorable; Ahlbom's account showed a five-year cure rate of 25 per cent for malignant tumors in 93 cases and included a comparison between the results of treatment of the tumors located in the large oral salivary glands and those in other oral regions established a five-year cure rate of 25 per cent for the former group and no less than 50 per cent for the latter. These results are, as far as I am aware, superior to those obtained in other countries and reported in other published accounts.

Results have later become even better, and I shall briefly mention the most recent statistics from Radiumhemmet, given by Edwall and covering the years 1940 to 1949, for tumors in the parotid region, which had an average frequency of recurrence of only 3.6 per cent. For benign tumors this rate was 1.2 per cent, and for malignant ones, 12.8 per cent. Facial paralysis occurred in 6.4 per cent of the cases of benign and semimalignant tumors and in 24 per cent of the cases in which the tumor was malignant.

Lymphoma colli in a large number of cases will turn out to be a metastasis from an occult cancer. A statistical account from Philadelphia, published by Blady in 1947, showed that more than one-half of such lesions—53 per cent—could be traced to a primary tumor in the head or the pharynx. The fact is not sufficiently recognized that a glandular metastasis of this kind may be the earliest symptom of an otherwise silent cancer, and Hayes Martin's account from the Memorial Hospital in New York shows that it was so in no fewer than 8 per cent of the cases in which the primary focus was located in the oral cavity. In searching for the site of the primary focus, which it is of paramount importance to locate, a thorough examination of the oral cavity and the teeth is mandatory. All this is the more important, because even if the tumor has metastasized, the prognosis is not quite so unfavorable as is generally assumed. Such metastases can be successfully removed by surgical intervention, and radical, even bilateral removal of the cervical lymph nodes should be performed. Of course, adequate treatment of the primary tumor is also necessary. Operable metastases are, consequently, treated by extirpation (total neck dissection on the affected side),

in most cases after preoperative irradiation by means of teleradium. If the presence of metastases cannot be demonstrated clinically, no operation is performed. The patient is kept under close observation after the primary tumor has been treated, and neck dissection is performed only if metastases make their appearance. Sandberg's account from Karolinska sjukhuset in the period during which I was myself attached to that hospital, comprises 73 patients, on 93 of whom neck dissection was performed. Only 1 patient died. Follow-up examinations, unfortunately not undertaken until a year later, showed that 31 of the 53 patients who were reexamined—that is, almost 60 per cent—remained without symptoms. In 8 the tumor had relapsed. Fourteen had died from cancer and 2 from other causes.

The third principal group comprises problems that are common to dentists and doctors, in the management of which the two constitute a team, so to speak, and each has equal responsibilities.

The diagnosis as well as the treatment of the "medical" complications of dental disease thus are the responsibility of both doctor and dentist. These "medical complications" were mentioned by the ancients. Hippocrates, the "Father of Medicine," described a case of rheumatism cured by the extraction of a tooth; moreover, he mentioned diseases in remote organs that had been caused by diseased teeth. He and his contemporaries and successors were precursors of the "oral sepsis" of our time, a concept created by William Hunter of McGill University in Montreal, Canada, in 1910, and comprising the general disease originating from such latent foci. The condition was named "focal infection" by the Chicago internist Billings in the same year. Its importance is great, and the dentist will often encounter "quiescent foci" in his daily work. Billings' own account of 577 cases of disease of the joints states that, in his opinion, the primary focus was located in the tonsils in 336 cases and in or around the teeth in no fewer than 136 cases—that is, in almost 25 per cent. All other points of origin, e.g., the prostate (as later demonstrated by Romanus at the Karolinska sjukhus), the internal female genital organs, the sinuses, the bronchi and the appendix, were each represented by fewer than 25 cases. I have treated and reported a case of thyroiditis in which such a genesis must be presumed. It is incontestable that, in such tonsillary, dental and paradental foci, pathogenic microbes, often of low virulence, are often present; and by injections on experimental animals it is often possible to induce conditions that bear a certain resemblance to certain chronic diseases of man. Moreover, Jarlov of Denmark has reported that certain conditions of the joints may become exacerbated after the extraction of teeth. This has been taken to mean that there is, at any rate, a certain etiologic relation. More recent researchers have suggested that allergic mechanisms occur in a large measure with these conditions. In practical work as well as in research, the point is to keep one's balance between extremes: *Incidit in Scyllam qui vult vitare Charybdim;* he who avoids the Scylla of exaggerated enthusiam, what I have called the "American rage," which holds dental focal infection responsible for all known morbid conditions, will perhaps run the risk of ending up in the Charybdis of nihilism, which stamps the whole doctrine about dental focal infection as black superstition.

Teamwork is similarly called for in the treatment of *neural diseases* of the face. Trigeminal neuralgia, too, was described by Hippocrates, who was consulted by a Phoenician for such a condition. John Milton, in *Paradise Lost*, [illegible] perfect misery, the

excessive, overturns all patience." He might well have been referring to the extremely violent pain of trigeminal neuralgia, which often causes the patient to commit suicide. The diagnosis of this disease presents a heavy responsibility; moreover, in any given case it may be highly complicated and difficult to clarify. The branches of this nerve run in long, narrow canals of bone. If their many anastomoses with one another and with other nerves play a role, they are exposed to numerous impressions throughout their course, with ample opportunity for propagation of the disease. It is possible that they do play such a role; Sicher of Chicago, however, does not hold this opinion. An abundance of extracranial local causes may be implicated, from simple pulp hyperemia, secondary dentine formation, denticles and the effects of smoking a clay pipe to the most complicated conditions. Indeed, from the diagnostic point of view, retrograde pulpitis may contribute a most intricate problem, as Sicher pointed out. He mentioned a patient who was almost—fortunately only almost!—brought to a neurosurgeon on this account. Also, impacted teeth, especially wisdom teeth, may produce trigeminal neuralgia, of which a number of researchers, among them Robert Hertz of Copenhagen, have thrown light. More extensive diseases of the jaw, such as cysts and tumors, may also cause neuralgia. If one is faced with a tumor, intense neuralgia always suggests malignancy, although the fact must not be ignored that benign tumors, too, may give rise to neuralgia. Diseases of the sinuses, particularly of the antrum, and empyema may also give rise to such neuralgia.

Somewhat less varied is the picture of *facial paralysis*. Bäfverstedt, my assistant, Prof. Berghagen and Anna Nordenskjöld have described a peculiar disease, Melkersson-Rosenthal's syndrome, which is characterized by recurrent facial paralysis, edema and lingua plicata. Certain of its symptoms suggest an allergic or infectious-allergic genesis, and it has been stated that a complete sanation of foci in the oral cavity is an important part of the treatment of this condition, although the aforementioned researchers have admitted that this form of therapy has not yet had any striking result.

In the treatment of diseases of the temporomandibular articulation, intimate teamwork is directly called for. The dentist's special knowledge and ability will be most useful in cooperation with the surgeons, and I consider that a larger number of these diseases should belong to the dentist's field of activity than has been the case in many places. And in fact, the trend, as far as the arthroses of the temporomandibular joint are concerned, suggests that enthusiasm for active surgical treatment, with opening of the temporomandibular articulation and extirpation of the articular disc, is cooling off. This is perhaps a favorable trend, since this operation is a very large and hazardous procedure, out of all proportion to what has been achieved; at any rate, in my opinion, it should be attempted only as a *refugium ultimum*. I do not hesitate to classify it surgically as almost a "hands-off proposition," and I completely agree with Sicher, having been able to verify his opinion, that pains caused by conditions in the joint are due to spasms in the muscles around the joint and not to pressure on the posterior auricular nerve—it would be an anatomic impossibility. All these problems, however, are still awaiting their final solution, and research should contribute a real effort to clearing up the etiologic problems. In cases where the occlusal relations are normal, other forms of therapy may have to be employed, e.g., intra-articular cortisone injections of the type reported by the Americans, Ensign and Siedler in 1952.

The treatment of *fractures of the jaw*

likewise rests on teamwork. The surgeon is responsible for the larger surgical measures, whereas the application of bandages, especially intra-oral bandages, should be in the hands of a dentist specializing in this type of work.

Also on the very front line of first aid, in cases of emergency, is the competent person who first sees the patient. He must, of course, do what is in his power to save the patient's life; faulty emergency aid may forfeit that chance. Two risks threaten patients with these conditions: hemorrhage and respiratory difficulty, which may be so considerable that the patient is suffocated. Hemorrhages generally are not so violent that they cannot be controlled by the conventional treatment of wounds; but, in cases of severe hemorrhage, ligation to the external carotid artery may have to be resorted to. With regard to respiratory difficulties, the dentist must also know that when the lower jaw is fractured bilaterally the loose fragment in the middle occasionally is dislocated posteriorly by the powerful mouth-opener; the tongue falls back, so that the entrance to the larynx is closed, and the patient is suffocated. Placing him in the prone position, with his forehead resting on his hands, will be sufficient to cause the loose fragment to fall forward so much as to prevent suffocation and enable him to tolerate transportation to the hospital.

Not only does the treatment of fractures of the jaws call for a team to discharge the tasks; the same applies to practically all conditions requiring major surgical operations on and around the jaws, e.g., the surgical treatment of prognathism, in which the dentist must decide as to the character of the occlusion, the possibility of reconstructing the jaw after the operation and of making the necessary adjustments. Finally, he must obtain the necessary postoperative fixation of the fragments by means of intraoral bandages. In all treatment of *major oral surgical defects*, e.g., those left by resection of the jaw, the assistance of the dentist may be required. Making the prostheses naturally is entirely his responsibility, whether for surgical defects or defects due to other causes, e.g., traumas, corrosions or burns, which are attended by a considerable risk of contractures. Certainly, no effort should be spared to prevent contracture.

Above all, if I may repeat myself, I should like to reiterate my rule of guidance: "We must remember that we are treating, not the morbid condition by itself, but the patient, a human being."

SUMMARY

The object of this study is to outline the vast field of maxillofacial and oral surgery and, more particularly, to emphasize the importance of teamwork between the surgeon and the dentist.

The subject has been divided into three main groups: one in which the dentist has the most important and most responsible task; one in which the bulk of the responsibility falls on the surgeon, and a third in which the dentist and the surgeon share the task and the responsibility equally.

In the first group, the dentist is frequently faced with diagnostic problems, the most important of which are presented by oral precancerous lesions, certain tumors of the jaws, including adamantinomas and mucus-secreting tumors, and the oral location of the mucous and salivary gland tumors; further, the diagnostic problems concerning giant cell tumors, particularly the epulides, as well as their relation to hyperparathyroidism, are discussed.

Special attention is given to actinomycosis, concerning which the pioneer work carried out by the Dane Per Holm is reported, as well as his division of the ac mycetes into four groups. Three cli forms are described: the "classic" fo

the so-called "atypical" form and the form first reported by the author.

The second group, in which the surgeon has the main responsibility, covers the complications involved by inadequately treated inflammatory lesions around the tooth, the treatment of which complications is beyond the competency of the dentist. The same applies to the treatment of oral carcinoma, the early diagnosis of which is repeatedly emphasized as the most important weapon in the fight against cancer. The prognosis, as well as the present-day treatment, is outlined.

In the third group, "oral sepsis" and "focal infection" are dealt with; further, lesions of the trigeminal and facial nerves, diseases of the temporomandibular joint and, finally, fractures of the jaws are discussed. All of these conditions call for the cooperation of dentist and surgeon on equal terms.

ZUSAMMENFASSUNG

Das Ziel der vorliegenden Arbeit ist, einen Überblick über das umfangreiche Gebiet der Kiefer-und Gesichtschirurgie zu geben und vor allem die Wichtigkeit der Zusammenarbeit von Chirurg und Zahnarzt hervorzuheben.

Das Gebiet wird in drei Hauptgruppen eingeteilt. In einer davon fällt dem Zahnarzt die grösste Verantwortung und Aufgabe zu, in der zweiten dem Chirurgen, und in der dritten teilen beide gleichmässig Aufgabe und Verantwortung.

In der ersten Gruppe steht der Zahnarzt oft diagnostischen Problemen gegenüber, zu denen in erster Linie präkanzeröse Erkrankungen, gewisse Kiefergeschwülste, einschliesslich der Adamantinome und schleimproduzierenden Tumoren, sowie die in der Mundhöhle gelegenen Geschwülste der Schleim-und Speicheldrüsen gehören; ferner werden hier die Schwierigkeiten der Diagnose bei Riesenzellgeschwülsten und besonders bei Zahnfleischgeschwülsten sowie deren Beziehung zur Überfunktion der Epithelkörperchen erörtert.

Besondere Aufmerksamkeit wird der Strahlenpilzerkrankung gewidmet. Auf die bahnbrechenden Arbeiten des Dänen Per Holm und auf seine Einteilung der Strahlenpilze in vier Gruppen wird eingegangen. Drei klinische Formen der Erkrankung werden beschrieben: die "klassische," die sogenannte "atypische" und die erstmalig vom Verfasser berichtete.

Die zweite Gruppe, die dem Chirurgen die Hauptverantwortung auferlegt, umfasst als Folge unzureichend behandelter entzündlicher Erkrankungen in der Umgebung des Zahnes auftretende Komplikationen, deren Behandlung über die Zuständigkeit des Zahnarztes hinausgeht. Das gleiche trifft für die Behandlung von Krebsen der Mundhöhle zu. Es wird wiederholt hervorgehoben, dass hier die frühzeitige Diagnose die wichtigste Waffe im Kampf gegen den Krebs darstellt. Die Prognose und die heutige Form der Behandlung werden umrissen.

In der dritten Gruppe handelt es sich um "Oralsepsis" und "Herdinfektionen." Ferner werden Erkrankungen des Trigeminus, des Fazialnerven und der Kiefergelenke und schliesslich Kieferbrüche erörtert. In allen diesen Fällen ist die Zusammenarbeit von Zahnarzt und Chirurg in gleichem Grade erforderlich.

RIASSUNTO

Scopo di questo lavoro è di sottolineare la vastità dei problemi della chirurgia orale e maxillo-facciale e di dimostrare l'importanza della collaborazione fra chirurgo e dentista.

Il campo è stato diviso in 3 sezioni: la prima, nella quale la maggior importanza spetta all'opera del dentista, la seconda al chirurgo e la terza, nella quale chirurgo e dentista si dividono in parti uguali le responsabilità.

Il primo gruppo comprende i problemi

diagnostici di competenza dei dentisti, fra cui il riconoscimento delle lesioni precancerose, di alcuni tumori della mascella (fra cui gli adamantinomi e i tumori mucipari) e dei tumori delle ghiandole salivari a sviluppo endoorale Devono essere molto presi in considerazione anche i problemi inerenti alla diagnosi dei tumori a cellule giganti, come gli epulidi, e i loro rapporti con l'iperparatiroidismo

Una particolare attenzione merita l'actinomicosi, che è strata trattata in un lavoro basilare del Dane Per Holm, sono stati descritti 4 gruppi di actinomiceti, mentre la malattia comprende tre forme quella classica, quella atipica e quella descritta per prima

Nel secondo gruppo, quello in cui la maggiore responsabilità spetta al chirurgo, sono comprese le complicanze dei processi infiammatori peridentali insufficientemente curate, e la cui terapia va oltre le possibilità del dentista E'compresa, inoltre, la cura del carcinoma della bocca—la cui diagnosi precoce e l'elemento più importante nella lotta contro i tumori

Il terzo gruppo comprende la sepsi della bocca e le infezioni focali, oltre alle lesioni del trigemino e del facciale, alle malattie dell'articolazione temporo mandibolare e alle fratture della mandibola Tutte queste condizioni necessitano dell'opera combinata e paritetica del chirurgo e del dentista

RÉSUMÉ

Cette etude a pour objet le vaste champ de la chirurgie maxillo-faciale et de la cavite buccale L'auteur insiste particulièrement sur l'importance du travail d'equipe entre le chirurgien et le dentiste Il a divise son travail en trois groupes principaux

Dans le premier, la tâche et la responsabilite la plus grande incombent au dentiste

Dans le deuxieme, le rôle du chirurgien est preponderant

Dans le troisieme enfin, une collaboration etroite entre le dentiste et le chirurgien est essentielle

Le premier groupe traite des problemes diagnostiques devant lesquels est souvent place le dentiste, les plus importants sont les lesions precancereuses, certaines tumeurs des maxillaires comprenant les adamantinomes et les tumeurs muco-secretantes ainsi que la localisation dans la cavite buccale des tumeurs des muqueuses et des glandes salivaires L'auteur discute egalement le diagnostic des tumeurs a myeloplaxes, en particulier les epulides, et leur relation avec l'hyper-parathyroidisme

Une attention speciale est accordee a l'actinomycose, domaine dans lequel Dane Per Holm a fait oeuvre de pionnier, sa division des actinomycetes en quatre groupes est rappelee Trois formes cliniques sont decrites la forme "classique," la forme dite "atypique," et enfin la forme que l'auteur de ce travail a ete le premier a decrire

Le deuxieme groupe, interessant avant tout le chirurgien, comprend les complications resultant du traitement inadequat de lesions inflammatoires peridentaires La therapeutique de ces complications n'est plus du ressort du dentiste Il en va de même pour ce qui est du traitement du carcinome de la cavite buccale L'auteur souligne l'importance primordiale du diagnostic precoce, celui ci etant l'arme la plus importante dans la lutte contre le cancer Le pronostic et le traitement actuel sont esquisses

Le troisieme groupe traite de la septicemie buccale et de l'infection focale Les lesions du trijumeau et des nerfs faciaux, les affections de l'articulation temporo-mandibulaire, et les fractures des mâchoires sont discutees Toutes ces affections reclament une collaboration etroite entre le dentiste et le chirurgien

Post-Traumatic Os Trigonum

A. GOTTLIEB, M.D., F.A.A.O., F.I.C.S.

LOS ANGELES, CALIFORNIA

PERSISTENT achillodynia should lead to the tentative diagnosis of os trigonum. The diagnosis should be corroborated by a history of injury to the foot in jumping or of continuous microtrauma in toe dancing. The injury may have caused a fracture in the tarsal region or the ankle, or it may only have produced a severe sprain; nevertheless, it may simultaneously have traumatized an existing os trigonum, contusing, subluxating or even displacing it, after stretching or tearing the fibrous capsule that unites it to the posterior tubercle of the astragalus. Since the lesion is chronic, the patient hardly remembers its onset.

Anatomic Features.—Os trigonum is an accessory bone located posterior to the tubercle of the talus, to which it is attached by a fibrous capsule and from which it is separated by a thin layer of hyaline cartilage. The line of division may be hardly detectable, or it may be a few millimeters wide, sharply outlined, smooth and equal in width throughout. The ossicle may be triangular, wedge shaped, oval or circular. It may be in one piece or fragmented; it may occur in one foot or bilaterally. It is observed in about 8 per cent of all roentgenograms of this region.

Clinical Signs.—Os trigonum may exist asymptomatically throughout life and be disclosed only casually in a roentgenogram. After it has been traumatized, however, the cardinal symptom is pain in the form of persistent achillodynia. The pain extends from the achilles tendon along the calf, the thigh and the small of the back. The pain may be constant. It may abate and recur after a sudden twisting of the ankle joint with the foot in plantar flexion, as in any activity on tiptoe. In addition to

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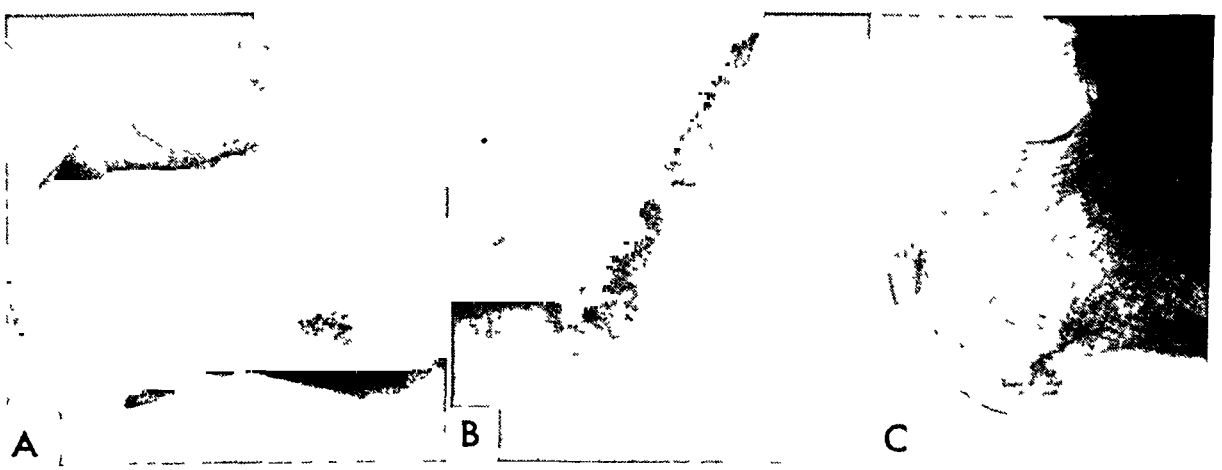

A (Case 1), asymptomatic os trigonum caused by chronic arthritis of tarsal articulations. *B, (Case 2)*, os trigonum in dancer who had sustained an injury of the foot. Note triangular segment of bone separated from tubercle of talus. *C (Case 3)*, irregularly shaped os trigonum with almost invisible line of separation from tubercle of talus.

pain, there is limited motion of the ankle. The lesion being chronic, there are no visible signs of injury; nevertheless, a healed fracture in a roentgenogram of the tarsal or ankle bones bespeaks an old injury to the foot. Sharp tenderness is elicited by deep palpation, lateral to the tendon and directed diagonally towards the talus. Extreme plantar flexion causes severe pain.

Injury to the os trigonum must be differentiated from fracture of the posterior tubercle of the astragalus (the Shepherd fracture). With the latter the patient recalls a history of trauma to the foot in jumping, followed by pain, swelling, tenderness and roentgenographic evidence of injury. The fracture shows, behind the talus, a fragment separated from it by an irregular, uneven line, while an injury to the os trigonum characteristically has a smooth, even line of separation from the talus. Bilateral roentgen evidence of the ossicle strongly indicates a lesion of the os trigonum.

Sixteen cases of post-traumatic os trigonum have come under my observation. In 5 of them the condition healed under conservative therapy; in the others it required operative removal of the bone. Three typical cases are here reported.

REPORT OF CASES

CASE 1.—A patient complained of pain in the ankle caused by chronic arthritis of the tarsal articulations. An asymptomatic os trigonum was observed in a roentgenogram of the painful foot. The ossicle appeared bilaterally. It caused no deep tenderness, nor did it limit motion of the ankle (see illustration, *A*).

CASE 2.—A dancer had sustained an injury to the foot about eight months prior to examination. She complained of constant achillodynia. The pain was referred to the calf and up to the small of the back. Tenderness was present on deep palpation behind the archilles tendon. The roentgenogram showed a triangular segment of bone separated from the tubercle of the talus (see illustration, *B*). Conservative treatment having failed, it was removed by operation.

CASE 3.—A patient had sustained an injury to the ankle joint many months prior to examination. The symptoms were pain in the region of the achilles tendon, extending to the small of the back, and decided tenderness on deep palpation in front of the tendon. The roentgenogram showed an irregularly shaped os trigonum with an almost invisible line of separation from the talus (see illustration, *C*). Four weeks of immobilization of the ankle joint having failed, the ossicle was surgically removed.

Treatment.—The pathologic picture being that of a damaged joint capsule, with or without separation of the bone, immobilization of the ankle in plantar flexion in a plaster of paris cast may produce healing in about four weeks. If immobilization preceded by procainization fails to reunite the capsule, or if the ossicle is too widely separated from its parent and reunion will not take place, operative removal is indicated.

The Operation.—The foot is placed in dorsal flexion in order to free the ossicle from its narrow space. The incision is made on the fibular side of the achilles tendon. Through the deep layer of fat in the triangular space the bone fragment is loosened, separated from its fibrous juncture, digitally or with a gouge, or both, and lifted out. A few subcutaneous catgut sutures and several cutaneous sutures complete the operation.

The patient is permitted to bear weight in a few days. The joint is not immobilized.

SUMMARY

Os trigonum is a variation of the skeletal structure of the foot. It may exist asymptomatically throughout life, but after injury of the ankle, macrotraumatic or microtraumatic, it may be sprained or displaced. This causes chronic pain at the back of the heel, in the calf and even in the small of the back.

The diagnosis and treatment of os trigonum are described.

RÉSUMÉ

L'os trigone peut subsister durant toute la vie sans présenter de symptômes, mais il peut se luxer ou se déplacer après une lésion macro- ou microtraumatique de la cheville, causant ainsi des douleurs chroniques de la partie postérieure du talon, du mollet, et même de la partie dosale inférieure. Le diagnostic et le traitement du traumatisme de l'os trigone sont présentes.

RIASSUNTO

L'osso trigono è una anomalia dello scheletro del piede che può restare asintomatica per tutta la vita ma che può lussarsi in seguito a traumi piccoli o grandi dell' anca. Cagiona, così, un dolore continuo nella parte posteriore della caviglia, o anche al polpaccio. Viene tratteggiata la diagnosi e la cura di questa affezione.

ZUSAMMENFASSUNG

Das Os trigonum stellt eine Variation des Fusskeletts dar. Es kann das ganze Leben hindurch ohne Symptome zu verursachen bestehen. Nach schweren oder leichten Verletzungen des Fussgelenks jedoch kann es verstaucht oder verrenkt werden. Das führt zu chronischen Schmerzen an der Hinterfläche des Hackens, in der Wade oder sogar in der unteren Rükkengegend. Die Diagnose und Behandlung des verletzten Os trigonum werden besprochen.

Nothing could be more absurd, nay atrocious, than the means judicially resorted to . . . to detect witchcraft . . . It was asserted that a witch, even while enduring the pangs of torture. could only shed three tears, and these from the left eye; this was considered a sufficient proof of guilt by the judges of the day!

The preservatives against witchcraft were as absurd as the fear it inspired: some hair, parings of nails, or any part of a person bewitched, were put into a stone bottle with crooked nails, then hung up the chimney; this expedient occasioned most horrible tortures to the witch until the bottle was uncorked. Witches. moreover, cannot pursue their victims beyond the middle of a running stream, provided the fugitives had been baptized. I have even now a patient under my care who fancies himself bewitched, and asserts that the only way to guard against the evil is by driving a nail in the impress left by the witch's foot on the threshold. when she will discontinue her visits.

—*J. G. Millingen, Circa 1839*

Rare Malignant Tumors of the Rectum: Lymphosarcoma and Melanoma

CEVIK ALP, M.D., F.I.C.S.

ISTANBUL, TURKEY

SARCOMAS, though frequently observed in the stomach and small intestine, are rare in the colon, the iliocecal region and the rectum. In a review of rectal malignant tumors, Postlethwait reported 2 cases of lymphosarcoma in a group of 441 cases. In this clinic, a group of 374 cases of malignant tumors of the rectum and colon from 1938 to 1956 included none of this type.

Lymphosarcomas are neoplasms of the lymphoid system. They may occur at any age but are most common between the ages 45 and 61. The incidence is higher in men than in women. Starting from the submucosa, they usually develop on the anterior surface and are generally encountered at the rectal ampulla, though sometimes near the anorectal line. Circumferential infiltration is their special characteristic. The clinical signs do not differ from those of other rectal tumors.

Lymphosarcoma has an insidious beginning. On palpation the mass feels soft under the mucosa. The surface is dotted with ulcerations and foci of bleeding and necrosis. In general, the lymph nodes in the pararectal tissues are enlarged. The lumen of the rectum is narrowed because of the circumferential manner of infiltration. Growth is rapid, spreading over several months. Lymphosarcomas are sensitive to roentgen rays, and in some instances roentgen therapy has stopped the progress of the malignant disease; nevertheless, recurrence is common. The life expectancy is about two years.

CASE 1. (*Lymphosarcoma of the rectum in a man 34 years of age, reported through the courtesy of Prof. Kazim Ismail Gurkan*).—The chief symptom was copious bleeding during defecation. Constipation had been present for two months and had resisted all medication and treatment except irrigation. Bleeding began at the time constipation set in and varied from slight to abundant discharge of blood mixed with the feces. A first diagnosis had attributed the bleeding to hemorrhoids, which were present. Digital examination revealed no abnormality. Rectoscopic examination by Professor Gurkan disclosed a hemispheric tumor on the posterior surface of the rectal ampulla (at 15 cm. point, Fig. 1*A*); this had not been obvious to the palpating finger. The mucosa over the tumor was gray and dotted with bleeding ulcerations.

General physical examination and laboratory work gave negative results.

Perineal resection of the rectum above the ampulla was carried out. The pararectal lymph nodes were removed and the rectosigmoid fixed to the perineum.

Macroscopically, the tumor was a round, white hard mass 6 cm. in diameter and located 9 cm. from the anal ring.

Microscopically, there were aggregates of atypical cells with round hyperchromic, somewhat pheochromic nuclei, most of them without cytoplasm. Mitotic figures, reticulum cells and areas of red cell infiltration were also observed. The peripheral areas [illegible] blood vessels in a necrotic he

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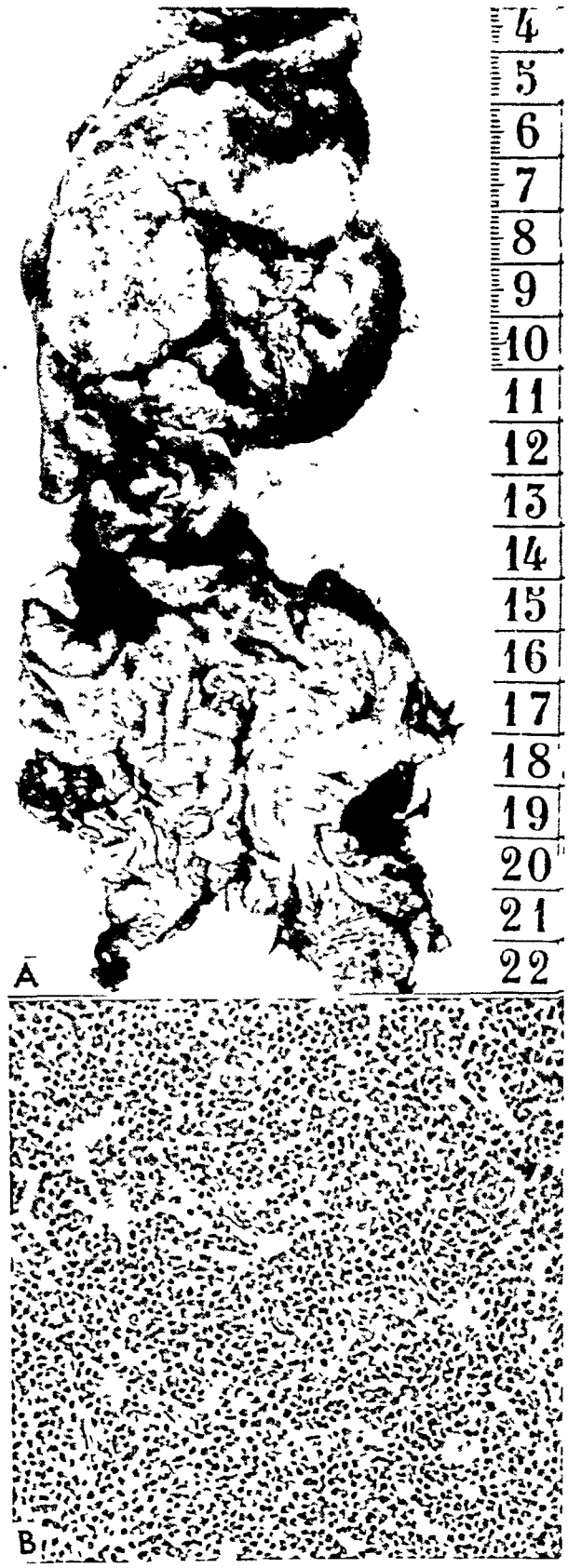

(Fig. 1*B*). The diagnosis was lymphosarcoma.

A few weeks after the operation the patient had twenty sessions of high voltage roentgen therapy, focused on the inguinal lymph nodes, the abdomen and the perineum. In the third postoperative month incontinence disappeared and evacuation became normal, but ten months after the operation the patient complained of abdominal pain. On examination a mass extending from the pubis to the umbilicus was disclosed. In the eleventh postoperative month a metastatic tumor the size of a tangerine was observed in the superior lobe of the left lung, and a month later another at the apex of the right lung. Death took place a few weeks thereafter.

According to world statistics, about 1.6 per cent of all melanomas are anorectal. Their incidence is greater in male than in female patients. The tumor develops at the anus and spreads toward the rectum. It originates from the pigmented and dendritic cells occupying the deepest layer of the skin. With the appearance of ulceration the characteristic dark blue color changes to black.

In some quarters the opinion prevails that an anorectal melanoma originates from a nevus near the anus, but this view is not unanimously held. Though the primary tumor may be very small, it is the source of large metastatic tumors in the liver and the inguinal and sacrococcygeal lymph nodes metastasizing by way of the portal system and lymphatics.

CASE 2 (*Melanoma of the anus in a 64-year-old man*).—The chief complaints were tumor in the anal area, frequent evacuation and bleeding, associated with marked loss of weight. Six months earlier the patient had felt a mass near the anus and on examination found that it was an enlargement of a nevus that had been present since childhood. Though small in the beginning, the mass gradually enlarged, and swellings appeared around it.

External examination revealed a hard black tumor about the size of an apple in the left

Fig. 1 (Case 1, *opposite*).—*A*, gross specimen of lymphosarcoma, showing tumor 6 cm. in diameter. There is bleeding at some points. *B*, microscopic view, showing atypical cells (see text). Note numerous blood vessels in peripheral hemorrhagic necrotic area.

lower abdominal quadrant. The mass was lobulated and showed an ulcerated crater. Digital examination disclosed hard, smooth masses, ranging from the size of a pea to that of a chestnut, covering the posterior surface of the ampulla to 8 cm. above the anus. The superficial and deep inguinal nodes were not palpable. General physical and laboratory work gave negative results.

The rectal ampulla and the retrorectal lymph nodes were removed by perineal resection.

Macroscopically the tumor was hard and black, with some ulcerations (Fig. 2*A*).

Microscopically, epithelial and atypical cells filled spaces between bands of fibrous tissue. Many of the cells contained melanin. The atypical cells had round or oval vesicular or mitotic nuclei in the cytoplasm (Fig. 2*B*). The diagnosis was malignant melanoma.

The patient returned for periodic checkups, and at the time of writing, two years after the operation, there has been no recurrence or evidence of disease.

SUMMARY

Two cases of sufficient interest to warrant reporting were 1 case of lymphosarcoma and 1 of melanoma of the anorectal region. The patient with lymphosarcoma obtained temporary benefit from perineal resection followed by radiation therapy, recurrence taking place within ten months and death within a year. In the case of malignant melanoma perineal resection gave good clinical results, and after two years the patient was still well, with no evidence of recurrence or metastasis. The lymphosarcoma occurred in a young adult, and the melanoma originated in a nevus.

RIASSUNTO

Vengono presentati due casi abbastanza interessanti, un linfosarcoma e un melanoma della regione perineale. Il primo fu sottoposto a resezione e roentgenterapia, con un transitorio successo; recidivò dopo 10 mesi e morì entro l'anno. Nel secondo (un melanoma maligno) la resezione del perineo fu seguita da successo e il paziente è ancor vivo dopo due anni e senza segni di recidiva o metastasi.

Fig. 2 (Case 2).—*A*, gross specimen of malignant melanoma (see text). Tumor was hard and black, with foci of ulceration and bleeding. *B*, microscopic view, showing epithelial and some atypical cells, many of which contained melanin.

dilated by the head of the worm, collapse over the much longer eggs and further prevent them from being swept back into the circulation. (S. japonicum eggs were first demonstrated in an adult male Filipino who died of terminal bacterial infection.) The blood vessel is thus transformed into a beaded tube almost completely obstructed by the eggs. Oviposition continues methodically, so that, once a small vessel is filled, the process is repeated in an adjacent larger vessel. It is theorized that most of the ova are trapped, only those in the superficial part of the mucosa being liberated.

As a rule maturation is rapid, and the egg develops into an embryo, a ciliated larva called the miracidium, which then starts secreting a semiviscose, irritating lytic fluid that spreads in a raglike pattern over the immediate vicinity and weakens the vessel wall upon contact. Among the factors that help directly or indirectly in extrusion of the egg are (1) the cytolytic ferments that ooze out of the submicroscopic pores in the eggshell, which initiate a proliferative endothelial reaction that covers the egg and also helps to digest the wall; (2) undue distention of the vascular wall by the larger, unyielding eggshell, further thickened by an endothelial envelope; (3) rising intravascular pressure against the mechanical obstruction produced by the egg, the ovipositing female and the circulating blood, and (4) increased peristalsis of the irritated bowel. The small vessel finally ruptures, and thus the egg escapes with a small amount of blood, which may be noticed coating the formed fecal mass. Eggs that have been trapped in the deeper portions of the mucosa and submucosa will probably remain there unless they are evacuated as a small rupturing abscess, after ulceration of the overlying epithelium.

The foregoing account explains (1) why only mature eggs, even if degenerated, may be observed in the feces, and (2) why eggs are usually present in the outer surface of the fecal mass. These are points of considerable practical importance in the collection and examination of fecal specimens.

The escaped eggs soon come into contact with water; the force of habit and the exigencies of an agricultural life cause the stools to be evacuated near rice paddies or irrigated fields. Owing to a difference in osmotic pressure, the egg imbibes water, and, as the intraovular pressure increases, the eggshell cracks and finally bursts open, liberating a free-swimming ciliated larva. A chemotactic tropism attracts the parasite to the specific snail host. In the case of S. japonicum, this will be one of the several species inhabiting only the countries bounding the China Sea; in my native Philippines it is the Oncomaenia quadrassi. This host the parasite must seek within twenty-four hours if it is to continue its development. Unsuitable snails have been known to repel the parasite. It penetrates the snail with the aid of a secretion from the retort-shaped glands on each side of the flask cells in the head. It enters the lymph spaces in the snail, loses its cilia and becomes transformed into a secondary sporocyst. It marches further into the lymph spaces of the liver and gonads of the snail to be transformed into a primary sporocyst, all this taking place within two weeks time (five to seven weeks after the start). It then leaves the snail as a free-swimming, infected fork-tailed cercaria 0.15 mm. long. There is conflicting evidence as to the role played by such factors as light, temperature, pH, and moisture on the emergence of the cercaria from the snail. It swims vigorously for twenty-four to thirty-six hours and then attaches itself, much like a mosquito wriggler, to the undersurface of the water, where other of its species tend to collect and wait for the unwary final human host.

Human infection starts when the bare skin comes into contact with infected water. As the unwary, unprotected and unshod farmer works in the fields watered by infested streams or fertilized by his own excrement, the cercaria is drawn to his skin, probably by the heat. The water film evaporates from the surface of his skin, decreasing its surface tension and forcing the cercaria to burrow both mechanically and chemically into the skin for protection, leaving its propelling tail behind. The cercaria has five pairs of penetrating glands, which secrete a proteolytic substance that enables it to penetrate the skin of the host.

The route taken by the parasite from here was studied and proved by Miyagawa as early as 1912 to 1918. In ten to twenty minutes the parasite has digested its way through the epidermis and is soon safely worming itself into the cutaneous capillaries, which it reaches in sixteen to twenty hours. It may, however, be trapped in a small lymphatic aggregate at this stage. Four hours later it enters a small peripheral vein. At this stage the organism measures 53 microns wide. From the periphery the return circulation carries it, now a schistosomula, into the lungs, whose capillary infiltration it achieves in four days. (It is to be remembered that once the skin has been traversed, no known antiseptic is effective against the organism.) The schistosomula is then pumped out of the pulmonary circulation into the systemic abdominal circulation. About one month later the schistosomula will have proceeded to swim, carried by the blood current, though the mesenteric arteries, the intestinal capillaries and the superior mesenteric vein to its habitat, the intrahepatic portal spaces.

Feeding upon the nutritious portal blood, the male parasite grows rapidly, and after a fortnight of adolescence he gathers enough courage to seek a mate and lock her into his gynecophoric canal. With his mate locked in his clasp, they swim against the blood current to the ileocolic and colic branches of the superior mesenteric artery and to its lower branches, the hemorrhoidal plexus, so that, four to six weeks after the original invasion of the skin, eggs may be observed in the feces. The parasites feed upon the blood, digesting the hemoglobin and converting it into hemosiderin or hematin, much in the manner of the malarial plasmodia. This pigment is regurgitated by the parasite and then taken up by the reticuloendothelial system, e.g., the histiocytes of the liver and spleen. The decomposition product is identical with malarial pigment in appearance, distribution and microchemical reaction. The same pigment is responsible for discoloration of the bowel wall and its regional nodes. The parasite excretes an increasing aggregate of metabolites, which cause the local reaction in the tissue and the general or systemic effects upon the body, supposedly on an allergic basis.

There are a few points that need further clarification. How old can a S. japonicum become? Bracken expressed the opinion that the parasite may live from five to fifteen years; Hayward computed it at thirty years not S. japonicum). Christopherson and Fanley reported that worms had remained in a patient for fifty-seven years without reinfection. Segard went further, claiming that the parasite may stay for the lifetime of the host, depositing eggs all the while, and may even live longer than the host. One consoling fact is that the parasite could not reproduce without the aid of its intermediate host, the snail. It should be remembered, however, that oviposition should not be taken as an accurate index of the presence of the worms, for, as the disease progresses, more eggs remain in the intestinal wall and more are carried to the liver, while the number extruded in the fec

creased. Besides, a predominantly male infection will cause little oviposition. *In vitro* experiments have shown that the adult worms can survive for five days under complete anerobiosis.

This brings up the point of the sex ratio. Normally equal numbers of male and female parasites migrate to the intestinal wall, although experimental infestation has always shown predominance of the male. Girges expressed the opinion that infestation with the male, exclusively or predominantly, is associated with more damage to the viscera, because it is the male that causes the damage during his sojourn in the liver. Besides, in cases of predominantly male infestation, though the ova are passed, the symptoms of toxemia are severe. Probably the male, after mating, drifts back to the liver, causing portal cirrhosis. Billings stated that the individual snail is infected with larvae of only one sex and that it is necessary for the development of disease in mammals that cercaria of both sexes, at the undifferentiated stage, should enter the host. Sevringhaus has shown that in unisexual infestation with S. japonicum the male normally attains sexual maturity in due course; but in unisexual female infestation the female does not reach sexual maturity. The possibility that the male may become a hermaphrodite in laboratory animals has been demonstrated.

What alternative mammalian hosts are liable to schistosomiasis? Most if not all mammals could be infected by S. japonica, and in most of them it is capable of developing through its full life cycle. It may infect dogs, cats, field mice, horses, sheep, cattle, water buffalo and even birds. Magath claimed that, owing to the small caliber of the vessels in the bowel wall of the wild rat, the female parasite usually deposits her eggs close to the portal vein and that they are swept to the liver rather than to the intestinal wall. The wild rat, therefore, cannot disseminate the disease widely, even if it can serve as an alternate host.

Can foci of S. japonicum develop in the United States? Hayward stated that experimental work has failed to produce infestation of snails indigenous to that country. Cram and Files in 1946 reported that 1.9 per cent of snails from the lake on the campus near Louisiana State University have shown cercariae of Schistosoma mansoni after experimental exposure to the parasite.

The biologic differences between S. japonicum, S. mansoni and Schistosoma hematobium explain the difference in specificity. The first-mentioned matures much earlier than do the other two (twice and four times as fast respectively). Thus the parasite is induced to locate a shorter distance from the liver, in the enterocolic circulation, while the other two lay their eggs much farther away, in the vesical plexus. S. japonicum appears to cause more severe disease and to be more resistant to chemotherapy, than do the other two, which probably is due to the greater number of eggs deposited by the first S. japonicum also matures much faster than do its two relatives.

Symptoms.—The clinical course of the disease has been divided into stages that correspond to the stages in the life cycle of the offending parasites. They are:

1. Incubation period: invasion, migration, maturation.
2. Acute dysentery: egg deposition and extrusion.
3. Chronic fibrotic stage: reactive fibrosis and irreversible visceral damage,

The incubation period is marked by local and general manifestations. Locally, sharp needling or stinging pains, followed by an irritative mild cutaneous rash or even actual dermatitis, occur soon after the skin is invaded (this corresponds with penetration of the skin and invasion of the sub-

cutaneous tissue). The general symptoms include an irritating, frequent and usually unproductive cough (though occasionally productive of viscid mucus), which appears within a few days (this corresponds to the parasites' penetration of the pulmonary fields). Subsequently, in two weeks, more intense and generalized urticaria appears, associated with such general toxic symptoms as headache, fatigability, mental dullness and anorexia. These symptoms are allergic reactions to the metabolites secreted by the worms as they lie more or less in the terminal vessels. There is some epigastric fullness, with tenderness in the upper part of the abdomen, which soon spreads all over the abdominal area; it may persist as actual pain four weeks later, and this corresponds to the migration and maturation of the flukes in the portal circulation.

Then, suddenly, painful bowel movements occur; stools mixed with blood and flecks of mucus are passed, and the abdominal symptoms are accentuated. This corresponds to deposition of the eggs in the intestinal wall and their subsequent extrusion into the lumen. Infestation with S. mansoni, instead of causing constipation or diarrhea, causes constipation alternating with diarrhea. An acute fulminating type of dysentery may occur in cases of particularly heavy infestation, associated with the formation of miliary abscesses in the liver and in other organs and tissues.

The severity of the symptoms varies. What is more usual is severe acute dysentery, less intense than the preceding type; the onset may even be slow and insidious, and in a few instances no symptoms whatever are present. The dysenteric attacks may pass off easily but are prone to recur, though at longer and longer intervals if no reinfestation occurs. The toxic symptoms vary in intensity depending upon the severity of the infestation.

The third stage is characterized by evidences of portal obstruction, hepatic cirrhosis and proliferative and degenerative changes in the colon, rectum and anus. Intestinal manifestations can appear only if there both male and female worms; if the infestation is purely or mainly male there will be more hepatosplenic lesions, but the toxemia will be just as severe or even more so. The symptoms are generally mild in the Philippine native population, probably because, as has been suggested in the case of S. mansoni among the Africans, the people have acquired partial immunity as a result of frequent exposure since infancy. Furthermore, the apparent endemicity of the disease is but an expression of the degree of infestation of a locality.

Pathologic Picture.— Much remains to be learned of the gross pathologic picture of schistosomiasis japonica; the literature on it is not as abundant as is that concerning the other two forms. As cutaneous lesions are in the nature of small petechiae, owing to intravascular occlusion. These petechiae are scratched and develop into shallow traumatic ulcerations, in which eggs may be isolated.

The Thoracic Roentgenogram.—The thoracic roentgenogram reveals bronchiolitis with consistent peribronchiolar accentuation, accompanied by minimal rales, which may be confined to the periphery or to a part of the lobe only. Less frequently there will be a well-defined soft irregular area of increased density in patches over both lungs. Obstructive pulmonary necrosis arteriolitis, the direct effect of ovular pulmonary embolism, is assumed to be a cause of right-sided heart failure, which, clinically, may simulate rheumatic or congenital cardiac disease.

Since the parasite is blood borne, vascular lesions are to be expected, this has been well described for S. mansoni. In addition to obstructive and proliferative endovasculitis there may be periv ular

lymphocytic or round cell infiltration, although no lesions of the periarteritis nodosa type are encountered. Thickening of the intima, either concentric or in plaques, and of the tunica adventitia may occur. The heart may show myocarditis without demonstrable egg deposits, edema or subpericardial agglomeration of red blood cells.

In the liver, irritative fibrosis primarily affects the portal spaces, and in time cirrhosis occurs.

Lesions of schistosomiasis mansoni affecting the various segments of the urinary tract, such as the renal pelvis, ureter, bladder and urethra, have been described. No such lesions have been encountered in cases of schistosomiasis japonica. The ectopic lesions of schistosomiasis japonica have been described as occurring in the brain, spinal cord. conjunctiva, skin, cutaneous nerves, scrotum, testis, ovary, kidney, adrenal medulla, retroperitoneal tissues, peritoneum, omentum, mesentery and seminal vesicles.

The lesions of the intestinal tract are of greater interest. Thickening of segments of the bowel has been described. Acute appendical gangrene due to ovular embolism is a recognized clinical entity. Intestinal lesions due to schistosomiasis japonicum are not as frequent as those due to schistosomiasis mansoni, owing to the shorter route taken by the latter as mentioned earlier. My opinion is that the shorter period of maturation of S. japonicum does not allow it to travel far, so that it causes much more hepatic damage than intestinal destruction. The intestinal lesions of S. mansoni in South America are not like those due to S. mansoni in Egypt; this is due either to an unknown factor or to less reinfestation. Histologically proved rectal schistosomiasis is not necessarily accompanied by clinical manifestations.

In a previous attempt to classify the rectocolonic lesions of schistosomiasis japonicum, I have set forth several arbitrary clinicopathologic stages.

Catarrhal Coloproctitis.—As soon as oviposition starts in the intestinal submucosa and the eggs leave the intestinal capillaries, irritation, both mechanical and chemical, is caused by the ova. There is an intense cellular infiltration of lymphocytes and polymorphonuclears, especially eosinophils. Owing to the miracidial toxin, coagulation and lytic necrosis occur in its immediate environs. Farther out a zone of enveloping macrophages is seen, attracted apparently by the leukocytes and the tissues that have been glued to the eggshell by this miracidial toxin. Excessive mucus is secreted by the lining glands as a reaction to the local irritants. Grossly, one sees an adenomatous mucosa, with patches of inflammation and congestion and a coating of mucus. With maturation of the ova more irritation occurs, and then fibroblasts, epithelioid and giant cells may be seen; and interspersed among these are eosinophils, lymphocytes and occasionally neutrophils, which have been initially attracted by the ova. Later the hyperemia is lost, the mucosa appears velvety and roughened by a fine, pinpoint, sandlike granulation and numerous grayish nodules 1 to 5 mm. in diameter. With eggs that are more deeply situated, such as those in the muscular coat, pseudotubercles are formed, small grayish fibrotic nodules imprisoning a nest of eggs. Progressive phagocytosis occurs, and in no time the egg is surrounded by foreign body giant cells and fibrocytes; occasionally it may even be encapsulated by a layer of calcium salts. The deposition of the calcium salts is presumably due to an ovular toxin. (A more detailed life history of the pseudotubercles is given by Koppish for S. mansoni). The incarcerated eggs may even be replaced by foreign body giant cells. Clinically the patient exhibits mucous diarrhea. What the passage of dys-

enteric stools, bleeding occurs owing to the intense hyperemia or from numerous punctiform mucosal hemorrhages. These mucosal ecchymoses give the bowel an appearance resembling measles, an appearance that is more marked in the presence of schistosomiasis mansoni than in that of schistosomiasis japonicum. In some instances these submucosal nodules of the eggs may be seen through the transparent intestinal mucosa. The mucosa may feel indurated to the touch; in fact, a metallic click has been described; and the mucosa bleeds easily when touched.

Suppurative Coloproctitis.—In the presence of particularly heavy infestation, as in reinfestation or with more intense oviposition, coalescence of adjacent lesions or discrete abscesses may lead to confluent abscess formation by contiguity.

In cases of light or initial infection, the presence of overlying hypersecreting mucus glands presents immediate disruption of the mucosa. In no time, however, more lytic necrosis takes place, and the dysentery becomes more evident. Proctosigmoidoscopic study will reveal accentuation and diffusion of the inflammatory process; hemorrhages will also become more marked, and the mucous coat will show tiny flecks of pus. The stools acquire a sanguinopurulent character and, owing to griping, crampy low abdominal pains and to tenesmus, which is accentuated with each evacuation, the act of defecation becomes a harrowing ordeal.

Ulcerative Coloproctitis.—Continuing inflammation and suppuration cause the abscesses to rupture, either singly or in groups, and form tiny small ulcers, with secondary bacterial invasion easily setting in. The irritative endarteritis or endophlebitis in the wall of the intestine predisposes also to ulceration. With the extrusion of the ova, more active processes of repair occur and round cell infiltration becomes more intense. Such an ulcer is about 1 mm. in diameter; it is small and round, with a granulating red base and dentate or irregular margins, and stands out prominently against its surroundings. Confluent ulceration results in wider areas or superficial erosion, in which case a pseudomembranous area slough, as described by Jaffe in connection with S. mansoni, may be observed. The dysenteric attacks become worse, and the pains in the lower part of the abdomen are exaggerated. Bits of sloughed, infected intestinal mucosa may be recovered from the feces, floating in the watery stools. In such cases, of course, there is more severe melena.

Polypoid Coloproctitis.—An unbalanced proliferation of tissue, evoked by the irritation due to accumulated ova in one place, results in the formation of polyps. Microscopic adenomas, in some cases atypical, have been described in studies of S. mansoni. Small polyps, either sessile or pedunculated, may form. Fibrosis at the base of the ulcer starts soon after the eggs are extruded, and also around the egg if it is located deep enough not to be extruded. With the proliferation of the mucosa still progressing rapidly, the surface grows out of proportion, becomes redundant and starts infolding upon itself. This follows much the same process that occurs in any intestinal polyp in which increased vascularity is responsible for overgrowth of the mucosa and submucosal fibrosis. Microscopically these polyps are similar to those following other chronic irritation, such as recurrent dysentery or nonspecific ulcerative colitis, save that here the telltale nests of S. japonicum eggs may be observed at their bases. S. japonicum only rarely causes polyposis as extensive as that due to S. mansoni, which in turn is less intense in South America than in Africa, so that it is assumed that the greater incidence of polyposis in the Egyptian may be due to a concomitant S. hematobium infesta-

tion. In the last-mentioned form the polyps may even be demonstrated radiologically may prolapse from the anus or may even twist upon themselves. They are usually dark, and they vary in size from pea-sized nodulations to the finger-like processes presenting a "cauliflower picture." With S. mansoni they have been reported to be as big as an apple and often pedunculated, or even to have been observed all along the digestive tube. Protoscopically, aside from these small polyps, there may be seen areas of superficial ulceration and numerous points of hemorrhage and congestion, in which other stages of the disease may be occurring simultaneously.

Polyps are clinically significant for two reasons: 1. It is assumed that the tearing off of small adenomatous polyps, together with mural necrosis and chronic mucosal inflammation, is responsible for the ulcerative stage. 2. There is an etiologic relation of polyps to cancer. An umbilication may show the site of a previously torn or necrosed polyp. Clinically the attacks of dysentery may subside only to be replaced by capricious rectal bleeding or symptoms of low intestinal obstruction and an irritable rectum. The patient may begin to show wasting, probably due in part to portal cirrhosis occurring simultaneously.

Intussusception has been shown to occur in cecal polyps.

Granulomatous Proctitis. — Prolonged and persistent irritation of the polyp may incite formation of granulomas, with proliferation and fibrosis. Increased demands by the rapidly growing polyp upon its small principal blood vessel, together with friction from the frequent dysenteric stool, soon leads to superficial necrosis, with an intermediate ulcerating-necrotic stage, the polyp thus "ulcerating itself" into a typical granuloma. Secondary bacterial infection occurs with great rapidity. Irritative and reflex phenomena are set up from the neighboring viscera, and the clinical picture becomes confused, the parasitic nature of the primary disease being clouded. Fibrosis proceeds at a rapid rate, and in a short while fixation of the pelvic organs occurs, freezing them into one solid discolored mass, indurated yet friable. General toxic symptoms, presumably allergic, also hepatic dysfunction may become more manifest.

Carcinomatous Proctitis. — The existence of the last stage of schistosomal coloproctitis will always be open to unresolved debate, and so will the transition from the granulomatous to the final stage. Microscopically one could see evidence of malignant change. Macroscopically the lesion is indistinguishable from a malignant tumor (which, in effect and in fact, it is). Clinically the lesion is undifferentiated also; the parasitic basis may be easily forgotten, the dysentery having occurred so long ago that the causal relation is lost sight of.

Other Lesions.—1. *Irregular thickening and fibrosis of the intestine.* Uniform involvement of the whole circumference of the colon transforms it into a rigid inelastic stenotic tube from cecum to anus. Grayish and brownish nodules as much as 1 cm. in diameter, representing pseudotubercles, are observed on the serous coat of the colon in various areas. The egg deposits appear as brown spots in yellow areas, with fibrosis supervening later. The fibrosis may be due to reaction to bacterial invasion associated with ulceration. The appendices epiploicae become enlarged and even fused, especially toward the mesocolic attachment. The deposition of hemosiderin, produced by the parasite from the hemoglobin of the red blood cells it feeds upon, in the reticuloendothelial system gives rise to the darkened lymph nodes, either in the mesentery or the retroperitoneum. These nodes may also show pseudoabscesses. The peritoneal accumulation of the pigment has been described. The

omentum may be thickened, fibrotic, rolled upon itself and adherent to the colon. The mesentery and the mesocolon are thickened and may even be matted together. The mucosal surface is irregular and may show numerous papillary projections, varying from minute spots to broad pedunculated polyps.

2. *Anorectal disease.* a. Rectal stricture. This develops as a result of cicatrization, with loss of elasticity and subsequent atrophy and replacement fibrosis.

b. Proctitis of varying degrees. This may be associated with rectal prolapse due to recurrent dysentery.

c. Hemorrhoids. These are due to venous obstruction by the adult parasites or to interference with lymphatic venous circulation following the local inflammatory infiltration and obstruction of the portal circulation when portal cirrhosis has occurred.

d. Papillitis. This involves both hypertrophy and inflammation.

e. Fistula.

f. Fissure.

g. Cryptitis. This is due to the presence of ova in the anorectal crypts. Ever since 1911, when Ferguson, then Professor of Pathology at Cario, drew attention to the frequent association between carcinoma and bilharziasis of the bladder (he studied 40 cases at autopsy and observed generalized infiltration with the growth in 10, suggesting a causal relation), there has been much controversy as to the actual relation between schistosomiasis and carcinoma of the urinary bladder. Probably the question will remain unanswered until we gain more definite knowledge about both the predisposing factors and the immediate nature of cancer.

A few facts are incontrovertible: 1. A toxin is secreted by the parasite or the ova. Japanese investigators have shown that the mechanical effect of the physical presence of the parasites is not enough to cause the disturbances attributed to it. The intravenous injection of killed ova into rabbits does not reproduce the nodules caused by the intravenous introduction of live ova into the same animals. 2. Persons with schistosomiasis are highly anemic in many parts of the globe, where the disease may affect large numbers of the population, separately from any other pathologic condition. 3. Prolonged irritation, both mechanical and chemical, has been known to cause cancer of the epithelial lining elsewhere. 4. The actual cause and pathogenesis of cancer is unknown.

Kawamura and Kasawa have hinted that derangement in the calcium and phosphorus metabolism and alteration of Vitamin A and B metabolism as the underlying change. Rats fed on diets deficient in Vitamin A and then experimentally infected with S. mansoni showed a retardation of the lesion's regression, although proliferation and phagocytosis were not hampered. Although the nature of the toxin has not been chemically proved, it is assumed to contain a diastase as well as a protein related to trypsin-digested albumin in alkaline material.

No analysis of comparable large series of vesical bilharziasis and cancer of the bladder are available. It is even supposed that the incidence of cancer is not really as high as postulated by some; much is attributed to diagnostic errors.

It has been postulated that, since bilharzial infestation has a high incidence anyway, the presence of vesical carcinoma may only be coincidental. Though it is admitted that vesical bilharziasis may lead to vesical carcinoma, the evidence as yet is not conclusive. Gelfand has been more liberal in his conviction; he has conceded that "bilharziasis does not ordinarily lead to carcinoma of the bladder, or only rarely."

Cancer of the bladder is not associated with cystolithiasis

cystitis, which seems to argue against mechanical and chemical factors in the causation of this type of vesical cancer.

A parallel example has been noted between cancer of the liver and schistosomiasis. Yamagiwa in 1911, Mouchet in 1918 and Pirie in 1921 expressed the opinion that an etiologic relation exists between schistosomiasis and primary carcinoma of the liver. Snidgers and Straub (1921) were the first to note the increased incidence of hepatic cancer in Chinese and Javanese. Warni in 1944 surmised that the increased incidence of cancer of the liver may be due to schistosomiasis. Bonne (1935) and later Hartz concluded that schistosomiasis is not a factor in the causation of cancer of the liver in the Chinese. Among the Filipinos primary carcinoma of the liver is quite common, and it is often superimposed upon portal cirrhosis. It has not been determined statistically that the incidence of cancer of the liver is higher in endemic areas.

Kazawa in 1921 noted an increase in the prevalence of intestinal cancer in regions infested with S. japonicum, and he reported 9 cases of intestinal cancer associated with schistosomiasis japonica at the bases of the lesions, which he interpreted as "due to heterotrophic glandular epithelial cells caused by the presence of the parasitic egg and to the adenomatous changes produced by the infiltration of the eggs, the role of the egg being partly mechanical and partly toxic." Five years later he offered what he considered sufficient experimental evidence that S. japonica plays a role in the genesis of intestinal cancer. Brumpt in 1930 reviewed these reports and concluded that the statistics then available did not validate Kazawa's earlier assertions. Studies by Martinez (1916), Sinderson and Mills (1923) and Delley and Fahmy (1924) showed that bilharzial papillomatosis does not show any special tendency to be followed by cancer. Ash and Spitz in 1945, reporting the presence of malign changes in a schistosomal polyp, restated the frequent coexistence of S. japonicum and cancer of the large bowel. Reports in the literature are not as numerous as in the case of bilharziasis associated with vesical carcinoma. Roman and Burke in 1925, reporting the case of a 19-year-old Puerto Rican girl with colloid adenocarcoma of the sigmoid and ova of S. mansoni even in the tissues and vessels, called attention to the fact that, despite the more frequent reports of intestinal schistosomiasis, there does not seem to be a corresponding increase in those of colonic cancer. They admitted that they were not "prepared to commit themselves entirely to the opinion that cancer of the large bowel was attributed to bilharziasis." Ewing stated that cancer is to be expected in cases of bilharziasis, and the increased incidence with age occurs as would be expected. Magalhaes, in 1941, claimed that the eggs of S. mansoni exert a carcinogenic effect on persons with a predisposition to cancer. Although Ferguson, in 1913, however, could not demonstrate an association between cancer of the rectum and intestinal bilharziasis (S. mansoni).

In a preview study of rectal schistosomiasis, discussing the question of whether it can initiate cancer, I answered "Perhaps." If it can be proved that vesical cancer, when associated with bilharziasis, is due to a toxin from the male embryo, than by analogy the conclusion may be drawn that it is even more likely that rectal schistosomiasis may initiate rectal cancer, because S. japonicum lays more eggs and thus would be more irritating. Of course, this does not take into account any difference in the composition and amount of the toxin actually liberated by the parasites, or of the difference in tissue reaction between the bladder and the rectum.

Diagnosis.—An absolute specific diagnosis of the infestation could not be made

without the demonstration of the offending parasite at any stage of its life cycle. Of course, however, it must be remembered that the converse is not always true; the absence of eggs does not mean the absence of infestation, because predominance of male worms may be the cause. The eggs may be demonstrated either in the feces or in the tissues of the human host. In the stools they may be demonstrated by direct smears or after sedimentation, acid-ether concentrations or egg-hatching technics, which are employed in cases of less heavy infestation. The specimens should come from the outer layer of the stool, because as the eggs are extruded they mix with the blood that coats the fecal mass and therefore abound on the surface of the stool. They may be discovered in various degrees of development and visibility, as here outlined:

1. Viable ova
    1. Immature
        a. Vitelline granulations diffusely distributed or limited to the poles, or with a vacuolated appearance.
        b. Various stages of embryonic development, from the diffusely granular unicellular stage through cleavage to the formation of a recognizable passive ciliated miracidum.
    2. Mature: active or deformed miracidium inside a transparent eggshell.
    3. Dubious vitality: various degrees of degeneration represented by a gradual loss of transparency of the embryonic envelope, with evidence of actual death of the miracidium.
    4. Actual death: progressive degrees of acidity of the embryonic membrane, with deformity, shrinkage, obliteration and even replacement calcification of the miracidium.

The eggs may be recovered from the tissue of the host in the outpatient department, the operating room or the morgue. The eggs are principally recovered from the rectum and liver. From the rectum the parasites may be recovered by the rasp technic of Fulleborn; with the swab employed by Khalil Salahiel Din and Messer, with the scraper used by Weller or by tissue biopsy. In 1913 Ferguson took a bit of rectal wall, digested in 3 to 10 per cent postassium hydroxide, and then centrifuged the mixture and sought ova in the sediment. Of late, much reliance has been laid upon rectal biopsy for demonstration of the parasite, chiefly owing to the efforts of the Southern American investigators (whose studies were made on S. mansoni). In 1943 Ottolina and Ascencio made the first description of postmortem rectal biopsies in cases of schistosomiasis mansoni, while demonstrating the preponderance (60 per cent) of rectal involvement in association with hepatic disease (45 per cent). Ottolina and Ascencio claimed that S. mansoni is never absent in the rectum when it is present in the liver. A piece of the middle rectal valve, which is drained by the superior hemorrhoidal vessel 9 or 10 cm. from the anus, is pinched off and digested for three to four hours in potassium hydroxide in an incubator, after which the sediment is centrifuged and examined for ova. The rectal valve is chosen because it has no peritoneum and the dangers of perforation after biopsy are therefore small. Being less vascular than the other parts, however, the area may not be representative; although this objection has not been borne out by actual experience. The same test was used subsequently by Rincon Undaneta, who demonstrated ova in 42.19 per cent of 128 cases. In 1946 Hernandez-Morales and M[illegible] that pressing [illegible] tissue

slides is often enough to demonstrate the ova, without the need of digestion. In 1947 Ottolina discarded potassium digestion, claiming that it was responsible for the false negative result in cases of light infestation, in which the eggs may be digested. He advocated washing the specimen in running water for three to five minutes so as to dissolve the hemoglobin, making the eggs more easily identifiable when the capillaries become more lightly colored, and at the same time allowing for easy compression of the tissue. The tissue was then pressed between slides and examined with a drop of water. In 1949 Pereira and Netto advocated multiple biopsies and introduced the oogram. The size of the sample is of little importance in demonstrating the ova; the degree of accuracy depends more upon the degree of infestation than upon any other factor. As has been mentioned, the absence of eggs should not always be interpreted to mean the absence of infestation, but if, in the course of treatment, there is sudden disappearance of the egg, it may indicate either an inhibitory action on oviposition by the adult female or a migration of the worm to larger tributaries of the portal circulation.

The state of viability and the degree of development of the egg are significant. Viable or even degenerating eggs may indicate actively ovipositing females or possibly a reinfestation. Dead or degenerated embryos could not mean inhibition of oviposition unless one agreed that degenerate or stillborn embryos may be deposited by the female. Atypism and degeneration of the egg are acknowledged to be the first changes due to the effect of effective therapy. The presence of dead eggs in the stools of persons without previous treatment suggests that spontaneous cure is possible on the basis of an immunologic reaction of the humoral or the cellular type. Biopsy, if the results are negative, should be repeated to obtain an unequivocal result.

Definite proof of the presence of infestation is made only by positive identification of the parasite or its ova. The fault common to all biopsy technics, the fact that the fragment removed and examined may not be representative of the diseased area, is to be remembered in evaluating negative results.

Other diagnostic methods that may be valuable include: proctosigmoidoscopy, cutaneous or intradermal tests, flocculation tests and complement fixation reactions. It is not to be expected that the results of the different procedures will be identical. The methods that require the demonstration and identification of the ova also require experience and do not give false positive reactions. I doubt that there are any actually pathognomonic proctosigmoidoscopic signs. Proctosigmoidoscopic study, with its inherent dangers, also requires experience, and is said not to be accurate in either the early or the late stages of the disease when few ova are extruded and no toxic changes are observable in the bowel. Besides, the lesions may persist even if there are no other clinical symptoms. The results of intradermal tests alone are equivocal; both false positive and false negative reactions may be obtained in any case. They may be positive only in cases of chronic infestation, and the positive reaction will persist as long as the parasite is present anywhere in the body. The basic nature of flocculation and precipitin tests render them susceptible to the vagaries of serologic procedures. In the case of flocculation tests, no relation between the response and the interval since the onset of the disease has been established, although there is a distinct correlation when one considers the severity of the symptoms and the nature of the reaction.

Liver biopsy has been used to demon-

strate schistosoma ova All of these diagnostic methods, particularly the biopsy, have been utilized for prognostic purposes During the course of the treatment several diagnostic tests are performed and the results evaluated in order to determine whether there is still active infestation, possible reinfestation and infestation under therapeutic control The infestation is cured if only dead eggs are found, and if there are recurrent eggs this denotes reinfestation Treatment drives the female upward into the liver

Since roentgenographic changes are observed in the bowel itself, roentgen demonstration of these lesions has been done, although some caution is needed in interpretation Filling defects to the extent of intraluminal intrusions are to be expected

Treatment —The treatment of schistosomiasis has not yet yielded encouraging results, despite the vigorous efforts exerted by public health services (to prevent the disease), the internist (to mollify its ravages), the chemotherapist (to kill the parasite) and the surgeon (to remove pathologic tissue whenever feasible) The public health man attempts to disrupt the life cycle by molluscidal agents and drainage The internist relies mainly on antimony, and the surgeon generally resects the obstructing tissues Treatment has been shown to interfere with ovulation and oviposition by the female, and furthermore it drives the females up the liver, away from the intestines A sudden large dose of an anthelminthic may kill the parasites, but it may also cause sudden obstruction and therefore is not as practical as killing the parasites slowly

SUMMARY

The author describes the nature and causation of schistosomiasis from the point of view of the proctologist, with a full account of the process through which it occurs in man He points out that the economic implications of the disease are more than that meets the eye What perpetuates the disease in endemic areas is not so much the lowered standard of living or the educational level of the native but his attempt to utilize more arable land, which in most cases drains infected streams His country which often has no money to spare for such problems, which are considered not immediately vital to its political and economic life In the author's opinion a greater impetus should be given to the control of this disease Its study is one of the few benefits derived by war-ravaged countries from the recent military campaigns

ZUSAMMENFASSUNG

Der Verfasser erortert das Wesen und die Krankheitsursache der Bilharziose und gibt eine genaue Beschreibung der Vorgange, die zur Infektion des Menschen fuhren Er weist darauf hin, dass die Bestandigkeit der Erkrankung in endemischen Gebieten nicht so sehr auf dem niedrigen Lebens oder Erziehungss andard der Eingeborenen beruht wie auf ihrem Bestreben, sich moglichst viel bestellbares Land zunutze zu machen, welches meistens von infizierten Flussen bewassert ist Im Lande des Verfassers fehlt es an geldlichen Mitteln, solche Probleme, die politisch und okonomisch als nicht unmittelbar lebenswichtig angesehen werden, zu losen Der Verfasser glaubt, dass mit grosserer Kraft an die Kontrollierung dieser Krankheit herangegangen werden muss Die Erforschung der Bilharziose gehort zu den wenigen Wohltaten, die von Kriegen erfasste Lander durch die Feldzuge der jungsten Vergangenheit davongetragen haben

RIASSUNTO

L'autore descrive la natura e la causa della schistosomiasi sotto l'aspetto proctologico e ne traccia tutto il quadro morboso

Egli sostiene che ciò che mantiene la malattia nelle zone in cui essa è endemica non è tanto il basso livello di vita o di cultura della popolazione quanto il tentativo di utilizzare sempre nuovi terreni da coltivare, il che in molti casi porta a nuove correnti di infezione. Il suo paese non ha mezzi economici da dedicare a questo problema, che non è considerato vitale sotto l'aspetto politico, ma lo meriterebbe. Lo studio di questa malattia è uno dei pochi vantaggi portati dalle campagne militari nelle regioni devastate dalla recente guerra.

RÉSUMÉ

L'auteur décrit la nature et l'origine de Schistosomiasis. du point de vue du proctologue, en décrivant largement la manière de transmission aux hommes. Il accentue, que la perpétuation de la maladie dans les régions endémiques ne dépend pas tellement de la pauvreté de la population ou de manque d'éducation, mais plutôt de l'effort de cultiver plus de terrain cultivable, qui plus souvent est arrosé par des rivières contaminées. Son pays n'a pas assez d'argent û dépenser pour des problèmes qui ne sont pas considerées d'être d'une importance immédiate et vitale pour la vie politique et économique. Dans l'opinion de l'auteur on devait mettre plus d'effort au controle de la maladie, Son étude est un de ces quelques biens, qui viennent de la part des pays dévastés par la guerre pendant les dernières campagnes.

SUMARIO

O autor descreve as caracteristicas da schistosomiase do ponto de vista do proctologista, com os detalhes de sua evolução no homem. Ele salienta que os inconvenientes econômicos são maiores do que parecem. O que perpetua a doença em areas endêmicas não é tanto o baixo nivel de vida ou educacional, mas a utilização de terras aradas, que em muitos casos drena zona infetada, Seu pais não encontra recursos financeiros suficientes para sanar tal mal, que não é considerado como imediatamente vital á sua vida política e econômica. Na opinião do autor, um maior impulso devia ser dado para o controle dessa doença. Seu estudo é um dos poucos benefícios advindos dos paises submetidos ás recentes campanhas militares.

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My fortune. from what flows in from my profession. is sufficient to gratify my wishes: indeed so limited is my ambition and that of my nearest connexions, that were I precluded from further practice I should be enabled to obtain all I want. And as for fame what is it? A gilded butt. forever pierced by the arrows of malignancy.

—*Jenner*

Local Corticosteriods in Anorectal Surgery

IRVING ROSENBERG, M.D., A.I.C.S.

PHILADELPHIA, PENNSYLVANIA

IT will be the purpose of this study to determine the efficacy of the corticosteroids, locally applied, in relieving long range postoperative anorectal discomfort. Modern surgical technics and anesthesia have reduced immediate (twenty-four hour) pain to a minimum. In this series the search is for a drug, locally applied, that will shorten convalescence. An attempt will be made to find the proper drug, dose, method and duration of application.

Rationale.—The anti-inflammatory action of hydrocortisone and fludro-hydrocortisone is a well known phenomenon. It has been postulated that "these hormones probably exert their antiphlogistic action by interrupting the chain reaction of cellular destruction triggered by the injurious stimulus. According to this point of view, inhibitation of inflammation is exerted by preventing the release and enhancing the removal of substances coming from injured cells."[1]

It has been suggested that the antiphlogistic adrenocortical hormones exert their effects by enhancing the resistance of surviving nonimpaired cells to the cytotoxic action of phlogenic agents. If the antiphlogistic effect is exerted in this manner, the initially released cytotoxic substance that potentiates the inflammatory response and continues the chain reaction of cellular destruction would in turn be decreased.[1]

A unified hypothesis was proposed by Eyring and Dougherty,[1c] in which it was suggested that all of the events occurring in the presence of acute inflammation can be explained by cellular injury resulting from lack of stabilization of the cell membrane. According to this hypothesis, the antiphlogistic hormones act by preventing cellular destruction, since they stabilize the impermeable state of the cell membrane.

It is contended that the act of performing an anorectal surgical operation, particularly a hemorrhoidectomy, is a traumatizing experience to the perianal tissue outside the surgical field; that interruption of normal venous and lymphatic circulation and release of phlogistic substance due to surgical trauma result in edema, most marked about the peripheries of the incisions. When hemorrhoids are widely dissected and islets are small, edema is most marked. Surgical principles judiciously applied are of great aid in preventing such phenomena, but they are not completely successful even if proper skin drainage is employed.

It is not uncommon for a surgeon to be pleased with a hemorrhoidectomy as the patient leaves the operating room, but in the ensuing week there are sometimes remarkable changes, such as those already described. Frequently this edema is slow to subside; subcutaneous fibrosis develops, and the end result is tab formation. Often such a formation requires surgical removal. It is postulated that hydrocortisone or an allied drug, properly applied in effective strength, would prevent or diminish this edema and increase the patient's comfort. Healing, too, should be enhanced by a better blood supply in the absence of edema.

Adjunct, Department of Proctology, Einstein Center, Northern Division, Philadelphia Attending Proctologist, Rolling Hill Hospital, Elkins Park, Pennsylvania

Submitted for publication Jan. 29, 1956.

"A good result at the operating table does not of necessity give good cosmetic results. But a good cosmetic result generally means a good functional result."[2]

Various authors imply that edema is a factor in the causation of pain, but no suggestion is made as to control other than that afforded by good surgical drainage. The fact that edema does occur in spite of good surgical drainage is not expounded.[3] It is the contention of this study that edema, in spite of good drainage, occurs in an average of 25 per cent of the cases. This figure was arrived at by discussions with many practicing proctologists.

The use of hydrocortisone, either in treatment of fibrotic lesions or in their prevention, has been tried both in the proctologic field and in other specialized fields. Sherman[4] applied hydrocortisone gel to lesions of factitial proctitis, with good results. Russek and his associates[5] employed systemic cortisone in cases of apoplectic stroke, with startling results. The rationale in such cases was based on retarding local cerebral edema, which contributes to the perpetuation of neurologic signs.[6]

Mention is made of the local use of these drugs in otolaryngologic practice. Rowlins[6] has employed them after curettage or fulguration of a contact ulcer of the larynx. Frequently granulation was prevented and healing improved. The drugs have also been employed in cases of fresh stricture of the esophagus.

Bonner, Lyons and Shields[7] have written a most interesting article in the urologic field. Eighteen patients with urethral and meatal strictures not responsive to the usual therapy were given submucosal injections of hydrocortisone, with excellent results.

Materials and Methods. — Hydrocortisone ointment was applied to patients postoperatively in an effort to minimize edema, fibrosis, tab formation and pain. No reports of past experience as to time, duration, or strength of ointment were available.

It was empirically decided to use ¼ ounce (7.08 Gm.) of 1 per cent neo-cortef ointment twice a day starting on the first postoperative day. The same plan was adopted for 1 per cent cortril with neomycin. The effect having been determined for this group, other strengths and products were employed; 2.5 per cent cortril, 0.1 per cent florinef ointment, 0.1 per cent florinef lotion and florinef-S ointment.

All florinef products were 1-ounce tubes fully used. No control series was employed. This was considered unnecessary at the time, since all that was being attempted was the establishment of the optimum time, dose of administration and most suitable product. After modifications have been made, a blind study is contemplated.

Particular attention was paid at all times to adequate skin drainage, in order to eliminate this as a factor. The hemorrhoidectomies were performed by a modified Milligan and Morgan technic and the fissures after the method of Gabriel.

The nature of the study dictates that many of the results are clinical impressions. No conclusions are to be drawn from this series; it represents, rather, the formulation of a starting point for future studies.

The total number of cases was 162. The operations all had in common the cutting of perianal skin and anal epithelium. In 148 cases a hemorrhoidectomy was performed even if other surgical conditions were corrected at the same time.

The application of all ointments or lotions was started on the first postoperative day and continued twice daily for four days. Since in the later stages of the study larger quantities were used, in all cases the product was so divided daily as to last the full time. The patients were generally

discharged from the hospital on the morning of the fifth day.

Each application was applied (on cotton) directly to the anus by the patient, except when lotions were used, in which circumstances the nursing staff was employed. Sitz baths three times a day in plain water were given in all instances.

Results. — A summation of the drugs and the results of their use follows. A few facts were associated in common with all the products except the lotions.

Long range pain was diminished Once the ointment was applied, no patient required more than codeine and aspirin several times a day. Improvement was noted in the demand for codeine and by the tenth day the need was gone. The patient was able to engage in gainful occupation on the morning of the fifteenth. When heavy manual labor was involved, work was forbidden until the twenty-first day, but the patients could engage in all other normal activities

There was a significant absence of third-day sphincter spasm. Not a single patient complained of this phenomenon.

Healing was definitely not delayed. In fact, it was noted that, in those cases in which there was less edema, healing progressed at a more satisfactory rate There were 4 cases of delayed healing, but in all instances this responded to local therapy with the usual applications and cleared up after a short interval. It was concluded that progress in these cases did not differ from that observed prior to the use of corticosteroids.

Results

*Drug**	*Total Patients*	*Total Male Patients*	*Total Female Patients*	*Good*	*Results Fair*	*Poor*
1% Cortril, 1% with Terramycin, ¼ oz	17	10	7	82% (14)	12% (2)	6% (1)
Neo cortef, 1% ¼ oz	18	8	10	78% (14)	22% (2)	0
Neo-cortef, 2 5%, ¼ oz	17	8	9	82% (14)	18% (3)	0
Florinef Ointment, 0 1%	30	17	13	87% (26)	10% (3)	3% (1)
Cortril, 21/2% ¼ oz	24	15	9	88% (21)	8% (2)	4% (1)
Florinef, 0 1% Lotion, ½ oz	26	14	12	69% (18)	19% (5)	12% (3)
Florinef-S, 0 1% Ointment, 1 oz	30	8	22	63% (19)	23% (7)	14% (4)

*One per cent cortril with terramycin contains 30 mg. of oxytetracycline as the crystalline hydrochloride and 10 mg of hydrocortisone free alcohol per gram

Each gram of 1 per cent neo cortef contains hydrocortisone acetate, 10 mg (1 per cent), neomycin sulfate, 5 mg (equivalent to 3 5 mg of neomycin base); methylparaben, 0 2 mg; butyl p-hydroxybenzoate, 1 8 mg Each gram of 2 5 per cent neo cortef contains hydrocortisone acetate, 25 mg (2 5 per cent); neomycin sulfate, 12 5 mg, methylparaben, 0 5 mg; butyl p-hydroxybenzoate, 4 5 mg

Florinef ointment 0 1 per cent lotion contains fludrocortisone acetate (0 1 per cent)

Cortril (2 5 per cent) in plastibase contains 25 mg of hydrocortisone free alcohol per gram

Florinef 0 1 per cent lotion contains fludrocortisone acetate (0 1 per cent).

Florinef-S 0 1 per cent contains 9a-fluorohydrocortisone acetate.

One per cent neomycin hydrochloride (as base) contains 2 5 mg, gramicidin 0 25 mg., in plastibase

No evidence of systemic absorption was noted. This fact is well established wherever this type of product was employed in these quantities.

All remaining scars were soft and pliable. The skin had a tendency to regenerate and to assume an appearance nearer to normal. Dense sheets of white adherent inelastic tissue were absent to a remarkable degree. This held true even if tab formation occurred.

The only dramatic observation was the absence or presence of edema in and around the wound, with subsequent fibrous tab formation. A summary of these results is tabulated.

It will be noted that the poorest results occurred when ½ ounce (14.1 Gm.) of 0.1 per cent florinef lotion was employed. Although it was the impression that fludro-hydrocortisone was as effective a drug as hydrocortisone, in this case the medium was the culprit. A patient cannot easily apply a lotion to his own anus. Reliance on nursing help is undependable. The lotion has a tendency to be rubbed off the anus by the patient's movements. All this contributed to a poorer cosmetic result in a larger number of cases.

If effectiveness is judged purely on the basis of the formation of skin tabs following edema, the tabulation here presented serves to demonstrate effectiveness.

Attention is directed to the fact that, as the study progressed and courage increased with experience, larger quantities of the corticosteroids were used in increasing strengths. This culminated in the use of 0.1 per cent fludro-hydrocortisone, which has a theoretical anti-inflammatory action roughly equivalent to that of 2.5 per cent hydrocortisone.

This was borne out since the results were as good as when 2.5 per cent neocortef was used, or better. But when florinef-S ointment (to which neomycin and gramicidin are added) was employed, the results were disappointing. I can only conclude from this that the combination is not as effective as when fludro-hydrocortisone is used alone. In all fairness to the combination product, if a three-month interval was allowed to pass, many of the fair results became good and many of the poor results fair. A delayed response seemed to occur; edema was more often not prevented but fibrosis did not occur, and this allowed the later "melting" of tabs.

The lotion failed miserably, entirely owing to the nature of the vehicle and its lack of the "sticking" property. In a sense this acted as a control, and encouragement was taken from this failure.

In the group in which neomycin or terramycin was an added drug, no detrimental or beneficial effect was noted.

Only one real complication was encountered. A great many patients complained that itching started in the second week. In most cases it was marked, but no changes could be observed in the skin. Pruritus ani is not uncommon after anorectal operations, but in this instance it was severe. It disappeared after a week, though no measures other than starch baths were employed to relieve it.

COMMENT

Apparently the corticosteroids have a place in the postoperative management of patients who undergo anorectal operations. Good surgical principles cannot be sacrificed in the hope that a locally applied ointment will compensate for inadequate drainage. Apparently, however, 2.5 per cent hydrocortisone or 0.1 per cent fludrohydrocortisone locally applied in amounts of 1 ounce distributed over one week will aid in relieving pain and expedite healing.

It is postulated that use of the ointment even earlier (as a dressing at the operating table) may enhance the effect. Theo-

retically, the subcutaneous perianal injection of hydrocortisone seems to be the method of choice This has not as yet been tried The experience of the Boston group in urethral strictures lends support to this theory Studies are now being performed in which 1 ounce of 1 per cent hydrocortisone with neomycin is employed Controls are utilized, and the entire series is "blind", that is, the surgeon does not know which patient is the control This will be a stepping stone to the application of 2 5 per cent hydrocortisone at the operating table and ultimately to the local injection of a corticosteroid while the patient is being anesthetized

CONCLUSIONS

1 Hydrocortisone and fludro-hydrocortisone apparently produce beneficial effects when applied to the anus after surgical intervention

2 A basis of future study is derived as to the best product, the mode of administration and the amount to be applied

3 Pruritus ani is a minor complication but disappears spontaneously

ZUSAMMENFASSUNG

1 Hydrokortison und Fludrohydrokortison haben offenbar eine gunstige Wirkung bei orthicher Applikation auf den After nach chirurgischen Eingriffen

2 Es wird ein Plan fur weitere Untersuchungen skizziert, um das beste Praparat, die geeignetste Form der Anwendung und die erwunschte Dosis in Erfahrung zu bringen

3 Eine geringfugige Komplikation, die von selbst verschwindet, ist das Jucken des Afters

RÉSUMÉ

1 Apparemment hydrocortisone et fludro-hydrocortisone, applique a l'anus apres une operation, produissent de l'effet salutaire

2 Le meilleur produit, la quantite et le moyen d'administration sont presentes

3 Pruritus ani est une complication mince, qui disparait spontanement

RIASSUNTO

1 L'idrocortisone e il fludro-idrocortisone sembra producano effetti benefici se applicati localmente dopo interventi sull' ano

2 Sono in corso ricerche sul prodotto piu efficace, sulla posologia e sulla tecnica di somministrazione

3 Il prurito anale scompare completamente

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Sigmoidal Resection for Diverticulosis of the Colon, Without Complications

FRANK RICHARD COLE, M.D., M.S. (Surg.), F.A.C.S., F.I.C.S.

SAN FRANCISCO, CALIFORNIA

EVER since its recognition as a clinical entity, diverticulitis of the colon has been in the lap, so to speak, of the internist. Its complications have been in the hands of the surgeon. With constructive surgery coming to the fore, however, the purely medical aspect of diverticulitis has come under scrutiny.

The complications, such as abscess, obstruction, peritonitis, fistula, hemorrhage and carcinoma, have been treated long after the original condition has given warning of its approach and its evil intent. Current thinking has become so routinized that a regime is instituted without taking into account the progressive character of the lesions concerned. The result is the occurrence of major disabilities as grave as any recorded in the surgical literature.

The fact that these disabilities can be averted will become evident if one applies the principles of surgery that have given such excellent results in the past ten years. If these principles were applied to diverticulitis with the same assiduity that marks their application to other fields—biliary surgery, for example—the same improvement in the morbidity and mortality rates would result. The same striking elimination of complications would be observed also. Prevention of complications is taken for granted with many other pathologic conditions, and so it will be with diverticulitis once the same scientific scrutiny is brought to bear upon the problem.

Pathologic Picture.—A few features of the basic pattern of diverticulitis are here enumerated:

1. A diverticulum is an outpocketing between the mesocolic and antimesocolic taeniae.

2. The diverticulum is hard. Its color is blue-black, owing to the presence of feces. It is lined with mucosa and communicates with the bowel through slitlike openings.

3. Diverticula occur most frequently in the sigmoid flexure. Less often, they occur in the cecum, the ascending portion of the colon, or the rectum.

4. The pathologic change that produces the symptom complex of diverticulitis is due to the difficulty of egress of the feces. This results in infection and in fistulas between viscera and body cavities.

It is evident, therefore, that the pathologic alteration is progressive; it can be likened to appendicitis. The analogy of the left-sided appendix is apt. The complications are graver than the practitioner usually considers them. Once the pathologic nature of the disease and the significance of its complications are understood, it is obviously absurd to take recurrent diverticulitis for granted. To wait for a major disease to develop before beginning to think constructively is by no means consonant with modern surgical theory and practice. Judd,[1] in a notable editorial, has presented an excellent example of the kind of constructive thought that is needed here.

From the Forest Hills General Hospital.
Submitted for publication May 1, 1956.

Treatment—With the advent of modern anesthesia, preoperative and postoperative therapy and the use of antibiotics in surgical treatment of the colon, primary anastomosis, in my opinion, has become the procedure of choice Whether or not a complementary cecostomy or transversostomy is added depends on the individual surgeon's conviction and the condition of the patient

About three years ago, therefore, I decided to treat recurrent sigmoidal diverticulitis by primary resection and anastomosis If the problem in the individual case permits me to avoid colostomy, transversostomy or cecostomy, so much the better These are problems that depend on the case and do not alter the primary concept A search of the literature at the time this decision was made yielded almost nothing relevant to my theory, almost all the authorities dealt with the end results of diverticulitis rather than with the disease in its initial stages Since conservative measures were preferred by both internist and surgeon, both the hot and the cold pack were used, antispasmodics and antibiotics were used promiscuously, without much conviction that they would eradicate the condition As a result, silent peritonitis, abscess and fistulas have been only too common A report has been made concerning the indiscriminate use of antibiotics [2]

My own regime, in brief, is as follows

1 Five days before the operation the patient is started on a high protein, high carbohydrate, nonresidue diet

2 If the total protein content of the blood is low (less than 5 6 mg per hundred cubic centimeters) and anemia is present, the patient is given blood and protein hydrolysates until the total protein level, the erythrocyte count and the hematocrit reading are satisfactory

3 Anemia is corrected, and 1,000 cc of blood is held in readiness for the operation

4 An evening enema is given daily, and two days before the operation castor oil (1½ ounces) is ordered

5 Sulfathaladine, 2 Gm five times a day, is administered, beginning four days prior to the operation

6 Dihydrostreptomycin, 2 Gm daily, is given for two days before the operation

7 *Neomycin, which was not generally* available when my regime was instituted, is now used The dose is 1 Gm four times a day for one day

Postoperatively, my regime is as follows

1 Demerol, 100 mg , is given every four hours for pain

2 An infusion of 1,500 cc of 5 per cent dextrose in water and the rest of the unused blood is administered in the first twenty four hours

3 Wangensteen suction is used for the first three days This is accompanied by intravenous fluid administration of 2 000 cc of 5 per cent dextrose in saline solution

4 On the third day the patient usually has a normal bowel movement, and on the next day he is out of bed Rectal tubes are introduced with great caution, if at all Reliance for the relief of distention is placed on suction If necessary, a low enema is given on the fifth day

5 The cutaneous sutures are removed on the seventh day and the retention sutures of black silk on the ninth The patient is discharged on the tenth postoperative day

This postoperative regime was followed in all of the 3 cases to be reported I present these cases not from the statistical standpoint but because of the type of surgical therapy used—what I call a "conservative radical" approach conservative because complications of the disease are

prevented, and radical because I do not wait for these complications to develop.

REPORT OF CASES

CASE 1.—A. B., a man aged 69, was admitted to the Horace Harding Hospital in May 1939. He complained of pain in the lower part of the abdomen, principally in the umbilical region and the left lower quadrant. The pain was cramplike and sometimes accompanied by rectal bleeding, which had been profuse in the latter part of the month prior to admission. The patient had never undergone a complete examination.

On examination, the pain was so severe as to cause the patient to cry out loudly. There was secondary anemia (hemoglobin, 50 per cent; red blood cells, 2,000,000 per cubic millimeter). Rectal examination revealed no masses, and sigmoidoscopic study gave negative results. Roentgenograms revealed multiple diverticula of the descending portion of the colon and the sigmoid flexure.

A diagnosis of diverticulitis was made, and, since there was no evidence of obstruction, the patient was prepared for operation according to the regime aforedescribed. At operation a thorough exploration was done. The essential abnormalities were multiple diverticula of the ascending and sigmoid portions of the colon, with numerous adhesions to the small bowel and the bladder. No actual fistulas were present. The adhesions were separated, and the splenic flexure and the descending and sigmoid portions of the colon were resected. The transverse portion of the colon was then anastomosed to the iliac portion. Interrupted sutures were used throughout. A complementary cecostomy was not done.

Postoperatively the patient did well. At the time of writing, he has been followed for three years. Once every six months he is in the office for a checkup. He has worked constantly and has had no abdominal cramps and no rectal bleeding.

CASE 2.—E. A., a man of Italian-American descent aged 59, was referred to me because of pain in the lower part of the abdomen for the past five years. Previous examinations had disclosed multiple diverticula of the descending portion of the colon. On admission the patient complained of rectal bleeding in addition to the pain. The treatment previously given had consisted of the administration of antispasmodics and antibiotics.

The patient was transferred to the Forest Hills Hospital, where he was observed to be anemic (hemoglobin, 60 per cent; red blood cells, 2,800,000 per cubic millimeter). The hematocrit reading and the value for total proteins were within normal limits. Rectal examination revealed no masses. Sigmoidoscopic examination gave negative results. A barium enema showed multiple diverticula of the descending and sigmoid portions of the colon. No obstruction was present.

The patient was prepared for operation in accordance with the foregoing outline. At operation, in addition to the multiple diverticula already mentioned, a fistula was observed between the upper part of the sigmoid and the lower part of the ileum. The splenic flexure, the descending portion of the colon and the upper part of the sigmoid flexure were resected. The fistulous tract was excised. The ileum was sutured with atraumatic No. 00 chromic Connell sutures and interrupted silk Lembert sutures. A complementary cecostomy was not done.

The postoperative course was stormy. The Wangensteen suction had to be continued for six days. A rectal tube was introduced on the fifth day, and a low soapsuds enema was given on the sixth. From that time on, recovery was uneventful. On the day he was discharged (the tenth postoperative), the patient had two normal bowel movements.

CASE 3.—H. G., a man aged 50, was admitted to the Forest Hills Hospital in May 1955, complaining of cramplike abdominal pain of three years' duration. Various diets, antispasmodics and antibiotics had given only temporary relief. There was no history of rectal bleeding.

Examination disclosed the patient to be well muscled, with tenderness in the left lower abdominal quadrant. There was slight spasticity but no rigidity. The results of a laboratory workup were normal. Rectal and sigmoidoscopic examination revealed no abnormality. Roentgenograms taken after a barium enema showed multiple diverticula of the sigmoid flexure.

After the usual preparation, the patient underwent resection of the splenic flexure and the descending portion of the colon. The transverse portion and the lower part of the sigmoid flexure were anastomosed in the usual way. Cecostomy was not done.

Postoperatively the patient did well. He had a normal bowel movement on the third postoperative day and was discharged on the

tenth. Since the operation he has worked constantly as an electronic engineer. Up to the time of writing he has had no discomfort of any sort. His diet is normal, and his bowel movements, from three times a day at the beginning, now occur once daily.

CONCLUSIONS

1. Recurrent sigmoidal diverticulitis is a surgical condition.

2. Resection and primary anastomosis for this condition, after adequate preparation, are feasible and should be considered.

3. Gastroenterologists and surgeons should recognize the fact that recurrent diverticulitis may require surgical as well as conservative therapy. Treatment should be administered by the "conservative radical" approach, which is designed to prevent the serious complications that may follows diverticulitis.

CONCLUSIONS

1. La diverticulite sigmoïdienne récidivante est une affection chirurgicale.

2. La résection et l'anastomose primaire au stade intermédiaire après une préparation adéquate sont possibles et devraient être envisagés.

3. Le gastro-entérologue et le chirurgien devraient admettre le fait que la diverticulite récidivante peut nécessiter aussi bien une thérapeutique chirurgicale que médicale. Le traitement devrait être basé sur une d'accès de "chirurgie radicale conservatrice." Cette voie d'accès, du type préventif, devrait pouvoir être appliquée à un plus grand nombre de malades.

SCHLUSSFOLGERUNGEN

1. Die wiederholt auftretende Divertikulitis des Sigmoideums stellt eine chirurgische Erkrankung dar.

2. Bei diesen Zuständen ist die Resektion und primäre Anastomisierung im Krankheitsintervall nach angemessener Vorbereitung ausführbar und in Betracht zu ziehen.

3. Magendarmspezialisten müssen die Tatsache anerkennen, dass die rückfällige Divertikulitis sowohl chirurgische als auch konservative Behandlungsformen erfordern kann. Die Therapie sollte auf "konservativradikalen chirurgischen" Grundsätzen beruhen. Dies ist eine prohylaktische Form der Vorgehens, die den Kranken in grösserem Umfange als bisher zugänglich gemacht werden sollte.

CONCLUSIONI

1. La diverticolite recidivante del colon è una malattia di carattere chirurgico.

2. La terapia è rappresentata dalla *resezione del colon con anastomosi primaria*, da eseguirsi nei periodi di stasi e dopo opportuna preparazione.

3. Gastroenterologi e chirurghi devono rendersi ragione della necessità di curare la diverticolite chirurgicamente oltre che conservativamente. La cura deve essere basata sul metodo "chirurgico conservativo radicale," che è un metodo preventivo *utile in molti casi.*

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Seccion en Español

Una Tecnica da Reseccion Corneal para Restauracion de la Vision Empleando el Microscopio Binocular de Disseccion

RICHARD PERRITT, M.D., F.I.C.S., D.A.B.

CHICAGO, ILLINOIS

HAY cuatro tipos: (1) optico; (2) terapéutico — una cicatriz central con tendencia a ulceración recurrente; (3) cosmetico—Acúmulo de cicatrices densas, blancas, extensas, *desfigurantes;* (4) mejoramiento de la córnea para la queratoplastía subsiguiente.

Desde los comienzos de la oftalmología se han hecho esfuerzos para mejorar la visión mediante reducción de la densidad de las cicatrices de la córnea. Han sido empleadas con ése fin: Dionina, jequirityh, ungüento de bisulfato de quinina, cloruro de colina (una solución al ½ por ciento) y últimamente, los rayos X y Radiaciones Beta.

Cuales son las indicaciones para ester tipo de Cirujía?

1. Keratitis en bandeleta (se dice que grandes dosis de Viosterol y Vitamin D producen estos depósitos en la córnea). La queratectomía parcial superficial tiene gran éxito en esta clase de opacidades especialmente se otras clases de queratoplastia significan mas riesgo parel paciente, como por ejemplo, un paciente monóculo afaquico.

2. Infiltración grasa de la córnea.

3. Infiltración calcárea de la córnea.

4. Distrofías de la córnea.

5. Opacidad extensia de la córnea conformación de *Pannus.*

6. Leucomas densos, que no incluyen la membrana de Descemet. Una queratectomía superficial reduce el eapesor y mejora la opacificación de la capa secundaria que no es tan densa como el leucoma original; sería quizás ventajoso hacer una iridectomía preliminar.

7. Infección tracomatosa de la córnea y vascularización superficial completa.

8. Explosión de carburo causando una opacidad superficial pero completa de las capas exteriores de la córnea.

9. Quemaduras de cal de la córnea.

10. Quemaduras de ácidos de la córnea.

11. Otras quemaduras, químicas de la córnea.

12. Explosiones produciendo opadidades superficiales por múltiples cuerpos extraños.

13. Opacidád de la córnea causada por gases lacrimógenos.

Contraindicaciones.—1. No se debe tentar la cirujía de la córnea hasta que toda la inflamación activa causada por la enfermedad ó el trauma haya cesado (un período de seis a doce meses) y no debe de haber evidencia alguna de fotofóbia, lagrimeo ó blefaroespasmo. 2. Glaucoma. 3. Pacientes muy nerviosos que no cooperan. 4. Gran sensibilidad a las drogas oftálmicas.

Un cuidadoso y completo examen con el

biomicroscopio y la lámpara de hendedura es un pre-requisito para determinar:

1. Irregularidades y diferencias en el espesora de la cicatriz ó cicatrices de la córnea.

2. Localización exacta, de la capa de la córnea afectada.

3. Grado, extensión y localización de la vascularización.

4. Condiciónes de la Descemet: depósitos, irregularidades, *precipitados.*

5. Condición de las estructuras subyacentes (por transiluminación y fotografía estereoscópica infraroja).

6. Evidencias de sinequías, anteriores y posteriores.

7. Uso preoperatorio y posteoperatorio de Rayos Roentgen, y Radiaciones Beta.

En todos los casos de vascularización de la córnea es preferible emplear radiaciónes preoperatorias. Las radiaciónes postoperatorias deben hacerse dentro de las cuarenta y ocho horas después de la cirujía. Tiene más éxito en éste momento porque los capilares neoformados son destruídos con mas facilidad. Una dosificacion adecuada es necessaria para el éxito de la radioterapia.

Tecnica.—El microscopio binocular con su reflector coordinado es suspendido sobre una barra horizontal y adjustada sobre la cabe za del paciente y a una distancia focal conocida, cási siempre, cinco o seis pulgadas del ojo del paciente, antes de la preparación del paciente. Después de una instilación de un colirio de cocáina al 4% —Se efectúa á continuación una inyección sub-sonjunctival perilímbica de novocaína y adrenalina.

Si la cicatriz es muy vascular se instila una solución at 10% de neosinefrina (clorhidrato) antes de la inyección subconjuntival. Ella controlará la hemorragia, aumentará el efecto de la anestesia y dilatará la pupila. Entonces se cubre el instrumento entero con una envoltura esterilizada adaptada para ello y se vuelve a poner sobre el paciente.

Con un escalpelo Lancaster modificado para que no profundice o una hoja de afeitar Americana #15 que fije dentro de un cabo Bard Parker, se realizaima incisión crucial, la cruz se bifurca aproximadamente a unos 3 millimetros a cualquier de ambos lado de la zona pupilar. Esto es hecho a fin de que la disección de la zona pupilar sea mas suave y menos irregular. La profundidad de la incisión se determina por estudios preliminares del grosor de la córnea-normalmente la córnea del adulto es aproximadamente de 1 millimetro en el periferio y ligeramente menor en el centro. En indivíduos mas viejos la córnea viene a ser ligeramente mas delgada. Yo he visto leucomas densos en córneas entre 2 a 3 millimetros de grosor.

El ápice de una de las cuatro cuadrantes entonces es enganchado por un delgado y agudo gancho corneal. El gancho es usado para levantar el completo grosor de la capa. Esto se verifica situando el gancho en el borde de la incisión con el cabo perpendicular a la superficie de la córnea y levantando el fondo del ápice del segmento a remover. El ápice es levantado y hecha la tracción para formar una linea de tajo. El escalpelo debe mantenerse propriamente. La parte de la hoja *junto a la punta* es usada (no la punta).

La hoja es mantenida paralelamente a la superficie corneal y inclinada ligeramente *hacia arriba.* La disección siempre es llevada a cabo, *recuerde esto* en un plano de corte hacia arriba, nunca en un plano, inclinado hacia abajo. Tan pronto como la córnea haya sido cortada lo suficiente, el gancho se sustituirá por un pequeño *forceps de joyería.*

Es resto de la disección es continuado y facilmente hecho siempre quedando en la misma linea del tajo hasta el limbo y entonces el cuadrante es removido. Si hubiere algunos vasos sanguíneos en el limbo con la directa ayuda de un micro-

scopio ser aplicado un fino *electrod* en el centro del vaso sanguíneo y el electrodo disecador.

Si el iris y el borde pupilar no son perceptibles después de la instilación de solucion fisiológica y hay un aspecto lactescente, ello significa que la incisión inicial no fué bastante profunda ó que el tejido de la cicatriz ha infiltrado todas las capas de la córnea.

Si hay que resecar mas capas de la córnea en éste momento el gancho tiene su mayor aplicación y provecho. Con mucho cuidado hago presión produciendo una indentación en la parte que hay que remover, empleando la punta del gancho diseco unas capas mas usando el cuchillo como hemos indicado previamente. Si la opacidad tiene forma de franja ó es limitada a una porción de la córnea. Se hace una incisión en la córnea clara a unos milímetros por fuera del límite de la cicatriz, dejando paralelo al lado de la cicatriz a el limbo. Se hace una incisión similar en el otro lado. Si tiene forma de sector, la primera incision cruza la primera incision cruza la segunda y se forma una punta. Luegose sigue la disección como se ha descrito previamente.

Al completar la operación, se instila sulfato de atropina al 1%, 1/3% de Bromhidrato de escopalomina y se vendan ambos ojos. Se sigue el proceso de epitelización usando flouresceina ede termina casi siempre en diez días. En el primer día del postoperatorio y cada día subsigueinte empleo dosis estimulantes de ultravioletas, por dos razones; (1) Estimula la regeneración epitelial y (2) produce una herida limpia. Ostras medidas terapeúticas postoperatorias son:

1. 1% de anilina roja soluble en agua.
2. 5% de solución de cloruro de colina en gotas.
3. Si hay tendencia a la edematización, se instila adrenalina al 1% otres o cuatro veces al diá durante cuatro ó seis semanas. Esto será una gran ayuda.
4. La córnea sigue aclarándose durante seis o nueve meses, durante los cuales empleo doscientos cincuenta T.U. Hyaluronidase en gotas. Esto estimula y aumenta el metabolismo de la córnea.
5. Si la córnea esta muy vascularizada, se empieza la radioterapia beta el primar día del postoperatorio y repitiendo cada dos semanas si es necesario.

Complicaciones.—Si se perfora la incisión incial, la córnea de un extremo al otro, instilo atropina al 1% y pongo un vendaje de Wheeler modificado. Se se abre la camara anterior durante la disección de unos de los cuadrantes, no remuevo aquélla sección de la córnea sino que permito que se cure por unos meses la herida y hago la disección en otra ocasión. La cámara usualmente se reforma en veinte y cuatro horas sin complicaciones.

SUMMARY

There are four types of corneal resection: (1) optical, (2) therapeutic, (3) cosmetic, and (4) ameliorative. The indications for corneal resection are as follows:

1. Band-shaped keratopathic conditions.
2. Fatty infiltration and calcium plaques of the cornea.
3. Dystrophies and thick leukomas of the cornea.
4. Extensive corneal opacities with pannus formations or those due to tear gas.
5. Trachomatous infections of the cornea.
6. Superficial opacity with multiple foreign bodies, due to carbide explosion.
7. Lime and acid burns of the cornea.

RÉSUMÉ

Il y a quatre sortes de Résection Cornéale: (1) résection optique (2) thérapeutique (3) cosmétique et (4) améliorante.

Lea indications pour la résection cornéale sont les suvantes:

1. Des conditions kératopathiques en forme de bandes.
2. Infiltration graisseuse et plaques calcaires sur la cornée.
3. Les dystrophies et leukoma épaix de la cornée.
4. Les opacités étendues avec formation de pannus et celles qui sont causées par du gas lacrymal.
5. Les infections trachomateuses de la cornée.
6. Les opacités superficielles contenant nombreux corps étrangers en suite d'une explosion de carbure.
7. Les brulures par chaux et acides.

Un examen minutieux et detaille a l'aide du microscope binoculair dissectant est indispensable pour determiner (1) des irregularites et differences de l'epaisseur de la cicatrice corneale, (2) le degree et la localisation de la vascularisation (3) la condition de la membrane de Descemet (4) l'evidence des synechies.

A l'aide d'un microscope binoculair et "spotlight" coordiné une incision en forme de croix est faite avec une lame de razoir tenue parallélement á la surface cornéal et tournée très légèrement en haut sans quitter la plaine de dissection. Un crohet cornéal est un aide indispensable.

RIASSUNTO

Vi sono 4 tipi di resezione corneale: (1) ottica, (2) terapeutica, (3) cosmetica e (4) di miglioramento. Le indicazioni della resezione corneale sono le seguenti:

1. Condizioni cheratopatiche a banda.
2. Infiltrazione grassa e placche di calcio nella cornea.
3. Distrofie e leucomi corneali.
4. Opacità corneali con formazione di manni.
5. Infezioni tracomatose della cornea.
6. Opacità superficiali con corpi estranei multipli dovuti a esplosioni.
7. Ustioni da calce e da acidi.

E' indispensabile una accurata e completa visita col biomicroscopio per stabilire: (1) le irregolarità e le differenze di spessore della cicatrice corneale; (2) il grado e la sede della vascolarizzazione; (3) le condizioni della membrana di Descemet e (4) la presenza di sinechie.

Col microscopio binoculare e luce adatta si pratica una incisione crociata con la lama tenuta parallela alla superficie corneale e piegata un poco all'insù, restando nella stessa linea di clivaggio. E' indispensabile l'impiega dell'uncino corneale.

RESUMEN

Existen cuatro tipos de resección corneal: (1) óptica; (2) terapeútica; (3) cosmética y (4) aliviadora. Sus indicaciones son las siguientes:

1. Padecimientos queratósicos en forma de banda.
2. Infiltración grasosa y placa de calcio en la córnea.
3. Distrofias y leucomas gruesos de la córnea.
4. Opacidades corneales extensas con pannus o bien debidas a desgarros.
5. Infecciones tracomatosas de la córnea.
6. Opacidad superficial con cuerpos extraños múltiples.
7. Quemaduras ácidas o básicas de la córnea.

Es indispensable un examen cuidadoso con el biomicroscopio, para determinar: (1) Irregularidades y diferencias de groser en la cicatriz de la córnea; (2) sitio y grado de la vascularización; (3) estado de l a — membrana de Descemet y (4) Evidencias de sinequias.

Con el microscopio binocular ilum se hace una incisión crucial con una ja de rasurar paralela a la superficie neal y dirigida—ligeramente hacia arri

permaneciendo en el mismo plano de despegamiento. Es indispensable un gancho corneal.

ZUSAMMENFASSUNG

Es gibt vier Arten von Hornhautresektion: 1. die optische, 2. die therapeutische, 3. die kosmetische und 4. die verbessernde. Die Indikationen zur Hornhautresektion sind die folgenden:

1. Bandförmige Keratopathien.
2. Fettige Infiltration und Kalkablagerungen in der Hornhaut.
3. Dystrophien und Leukome der Hornhaut.
4. Ausgedehnte Hornhauttrübungen mit Pannusbildungen oder durch Tränengas verursachte Trübungen.
5. Trachomatöse Infektionen der Hornhaut.
6. Oberflächliche Trübung mit multiplen Fremdkörpern infolge von Karbidexplosion.
7. Kalk- und Säureverätzungen der Hornhaut.

Eine sorgfältige und genaue biomikroskopische Untersuchung ist unerlässlich zur Bestimmung 1. von Unregelmässigkeiten und Dickenunterschieden der Hornhautnarbe, 2. des Grades und des Verlaufs der Gefässversorgung, 3. des Zustandes der Descemetschen Membran und 4. des Bestehens von Synechien.

Mit Hilfe eines Doppelmikroskops und koordinierten Scheinwerferlichts wird mit einer parallel zur Hornhautfläche gehaltenen und leicht nach oben gedrehten Rasierklinge ein Kreuzschnitt angelegt, wobei stets die gleiche Ebene des Spaltes einzuhalten ist. Ein Hornhauthaken ist ein unentbehrliches Hilfsmittel.

SUMARIO

Há 4 tipos de ressecção da córnea: (1) ótica, (2) terapêutica, (3) cosmética e (4) paliativa. São as seguintes as indicações das ressecções córneas:

1. Afecções queratopáticas em fita.
2. Infiltração gordurosa e placas de cálcio na córnea.
3. Distrofias e leucomas espêssos da córnea.
4. Opacidades córneas extensas, com formações de panos.
5. Infecções tracomatosas da córnea.
6. Opacidade superficial com corpos estranhos múltiplos, por explosão.
7. Queimaduras da córnea por alcalis e ácidos.

Um exame cuidadoso e completo com biomicroscópio deve ser feito para determinar (1) irregularidades e diferenças em espessura na cicatriz da córnea; (2) o grau e localização da vascularização; (3) a condição da membrana de Descemet e (4) sinais de sinequias.

Com o microscópio binocular e luz focal coordenada é feita uma incisão crucial com uma lâmina mantida paralelamente à superfície córnea e levemente inclinada para cima, mantendo-se na mesma linha de clivagem. Um gancho para córnea é um auxiliar indispensável.

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Important Announcement For 1957!

The International Scientific Congress of the International College of Surgeons will be held at the invitation of the Mexican Government and under the Honorary Presidency of His Excellency, Don Adolfo Ruiz Cortinez, President of the Republic of Mexico, February 24-28 inclusive, 1957, at University City, Mexico, D F The Grand Opening Ceremony will take place at the Palace of Fine Arts, and the scientific sessions in the University buildings

For further details address:

International College of Surgeons
1516 Lake Shore Drive
Chicago 10, Illinois

Attention Secretary, Mexican Congress

Editorials

Medical Journalism

THE inevitable accompaniment of the medical progress is an enormous increase in medical literature. A moderate estimate of the number of medical journals is probably somewhere near 10,000. Of these, between 4 to 5,000 are of value. In a recent editorial, Waife,[1] citing an estimate by the Armed Forces Medical Library, stated that 3,000 books in medicine and the allied sciences are published throughout the world in one year. The number of journals published in the United States is about 1,400. The Current List of Medical Literature indexed 109,274 separate articles in 1954.

Appalled by this plethora of medical literature, Sir Robert Hutchinson, in an article entitled "Medical Literature,"[2] exclaimed: "For let there be no mistake about it, this enormous proliferation, this pullulating and fungus-like growth is both a nuisance and a danger." Bjorneboe[3] found more than 8,000 scientific papers written on the subject of aureomycin alone. According to Dick,[4] "It may prove quicker to rediscover a known fact than to search and find that fact in the published literature." "What, then, is to be done?" exclaims Hutchinson. "Must we sit still and see science suffocate in its own secretions, or can we do anything to mitigate the evil?" Something must be done, because, to quote Osler, "Current medical literature cannot be permanently ignored with impunity. A doctor who does not use books and journals, who does not need a library, who does not read one or more of the best weeklies and monthlies, soon sinks to the level of the cross-counter prescriber, and not only in practice but in those mercenary feelings and habits which characterize a trade."

What about the quality of all this literature? Hutchinson points to the fact that the medical literature presents a great excess of facts and a comparative absence of ideas, generalizations, and hypotheses. In his opinion there is too much observation and recording and too little reflection. He would compare it to a heap of bricks without any mortar to hold them together. This dullness, he says, is the more curious considering that the subject matter is so interesting. He also remarks that medical literature exhibits only too often an absence of any sense of style or even of grammar. The root of the evil, he believes, is the consequence of *defective literary and linguistic education.*

What can be done about it? Probably stricter editing. The causes of this growth of literature Waife[1] finds in the fact that publications are important to a person who hopes to rise in the academic world. A bibliography helps in Specialty Board certifications, which, in turn, gives one some advantages in military and veteran's administration positions, and materially improves hospital staff appointments. This,

1. Waife, S. O.: The Present Plight of Medical Literature, Ann. Int. Med. 434:908 (Oct.) 1955.
2. Hutchinson, R.: Medical Literature, Lancet 2:1509 (Nov. 18) 1939.
3. Bjorneboe, J.: Responsibility of the Author and Editor in Preparing Manuscripts for the Press, World M. J. 1:111 (March) 1954.
4. Dick, W. E.: Science and the Press, Impact (UNESCO) 5:143 (Sept.) 1954.

together with local prestige, all leads to conscious or unconscious pressures to write papers

Apparently members of the American Medical Writers' Association felt that something had to be done to improve the quality of medical literature and of editing of medical journals Swanberg,[5] Secretary of the association, states "Medical men as a class, are poor writers Without attempting to determine the cause, editors of medical and scientific publications are in agreement that most scientific professional men do not possess the ability to write well" He further states "The idea of making every doctor and medical scientist an expert in exposition is, of course utopian Medicine needs the help of nonmedical college graduates who have been trained in medical journalism and writing 'to help maintain and advance high standards of medical literature There must be nonmedical college graduates who can examine a medical manuscript and correct the English In doing so, however, they must not change good medicine expressed in bad English into good English expressed in bad medicine They must help the author to convey his own thoughts clearly and precisely"

I quite agree with Dr Swanberg that the idea of making every doctor an expert in exposition is utopian But is it necessary? One should not expect every medical writer to possess the literary skill of an Osler, the charm of style of a Claude Bernard, the persuasiveness of a Hutchinson or a Moynihan I submit that it is quite reasonable, however, to expect a university graduate to be able to write acceptable English

In 1954 the American Medical Writers' Association suggested the establishment of four-year courses in medical journalism and writing, leading to a bachelor's degree Such courses have been established at the Universities of Illinois, Missouri and Oklahoma The University of Oklahoma had three applicants for such course the University of Illinois had one, and the University of Missouri had four The response was apparently poor

I am not enthusiastic about this method of meeting the problem, for two reasons First, I am opposed to creating another specialty We have enough specialties already Someone has said that in specialization we learn more and more about less and less until we know everything about nothing A more important objection is that the cause of this lies much deeper, and in this connection I should like to quote the opinion of Lawrence M Gould,[6] an eminent geologist and President of Carleton College "Language must be the chief concern of a liberal education In deed the basic characteristic of an educated man is that he be 'literate and articulate in verbal discourse' Here is one of the keys to the major needs of education *at all levels and in all departments* If I could impose my will completely I would require four years of English of all students and some extra courses in composition in the senior year for those who think they want to be scientists"

The medical literature consists of textbooks, monographs, archives or monthly periodicals and weekly journals Textbooks constitute almost obligatory reading for the medical student, but they are rarely consulted by the doctor, who prefers to read the contemporary periodicals Modern textbooks are expensive, and their usefulness is limited by the fact that they soon become outdated because of new discoveries, new concepts of disease, etc

A monograph is of interest chiefly to the specialist Its particular value is that it devotes itself to one subject The mono

5 Swanberg H Medical Journalism and Writing Courses Now Available Something New in Collegiate Education, Mississippi Valley M J 76 147 (July) 1954

6 Gould L M Carleton College Bulletin 12 1432 (Nov) 1945

graph reviews the literature on the particular subject, adds to it its own contribution, and presents a new concept or a new hypothesis.

Medical and surgical archives, appearing monthly, likewise appeal principally to the specialist.

The weekly journal has the widest number of readers because it reflects the current ideas and discoveries, articles dealing with therapy and matters of interest to the general practitioner as well as to the specialist.

The weekly journal consists of papers or articles, editorials, news and abstracts. With regard to "original articles," the consensus is that there are entirely too many. One would do well to read a booklet by George E. Burch[7] entitled "Of Publishing Scientific Papers." According to this author, "the investigator's writing should be initiated spontaneously to disclose to the scientific world scientifically accurate and theoretically sound ideas which constitute a *real* contribution. The investigator should be honestly convinced, from a thorough knowldege of the literature and his own researches, that at least these minimal requirements for his paper exist." . . . "The author should be permitted to present his observations and ideas in his own style without major alteration by publication policies or editorial disciplines." So far as the quality of papers is concerned, Burch considers the present situation defective, but he states, "Improvement cannot come as a result of controls, but only from demanding the highest integrity and performance among all concerned with writing of scientific papers. The fundamental responsibility for the character of scientific papers resides with the author."

One must not confuse *editing* with *editorial writing*. The purpose of an editorial is to direct the reader's attention to a subject and to stimulate his thought upon it. The editorial should stick to one point rather than scatter itself in many directions. Some editorials will deal with medical subjects and others with nonmedical subjects. The choice is unlimited. A worth while editorial is one which stimulates thought upon a particular question. Valuable advice from Garland[6] is that "to perform its function properly the medical editorial must be restrained and reasonable; it should provoke disciplined cerebration rather than merely arouse emotion. Certain proprieties consonant with the ethics of the profession should be preserved."

Abstracts constitute an important function of most periodicals. From what has been said about the bulk of the medical literature, it should be quite evident that no one could read all of this literature even if he confined himself to one specialty and devoted all his time to the reading.

Out of this situation there has developed the necessity for an editorial staff. The task of examining this tremendous amount of printed matter is assigned to teams of workers whose responsibility it is to select and abstract such literature as contains advances in research and in clinical work. The amount of literature to be surveyed is such that few journals can do the task on a universal level. New discoveries are made almost daily; old theories are discarded and are replaced by new. The general practitioner as well as the specialist is confronted by an enormous task if he wishes to keep himself well informed. The necessity, however, of keeping abreast of the new developments need hardly be stressed. It is for these reasons that the department of medical abstracts has become an important section of a medical journal. The selection and the making of abstracts will vary with the particular

7. Burch, G. F.: On Publishing Scientific Papers. New York: Grune and Stratton, 1954.

8. Garland, J.: Journalism and Editorial Writing, World M. A. Bull. (Jan.) 1951.

journal, depending upon the type of its readers and their medical interests.

The *Journal of the American Medical Association* attempts to give its readers a general universal survey of the current medical literature. It becomes the task of the man in charge of the Department of Abstracts to survey some 1,200 journals and select the articles to be abstracted. These articles will contain subject matter of interest first of all to general practitioners, who constitute the bulk of its readers, and next to the specialists.

An abstract is a composite product, in the making of which a number of persons participate. The chief of the department should preferably be a doctor with an extensive training and experience in clinical medicine, research and medical literature. It is his task to select the articles, which will then be abstracted by trained workers, not necessarily doctors. It is assumed that the doctor is interested in advances in the art and science of medicine. In the foreground of his interests loom up the more important diseases of the human race, such as the cardiovascular diseases, the kidney diseases, cancer, tuberculosis, rheumatic diseases, diabetes, etc. New concepts of disease and contributions from the field of experimental medicine and from the various specialties, in so far as they bear on the general problems of the organism, are the legitimate objects of his curiosity.

Some journals insist on having their abstracts as short as possible. Others prefer more extensive abstracts, even resorting to reproduction of the illustrations. A good example of the latter is the official organ of the American College of Surgeons—the International Abstract of *Surgery, Gynecology and Obstetrics*. There also exist journals devoted entirely to abstracts, such as the *Excerpta*, published in Holland. *Excerpta* appears in separate volumes, each limited to a specialty.

The advantages to be derived from following the medical literature are such that the importance of making abstracts will grow rather than diminish. It is a function that a medical journal owes to its readers. It is a difficult task, requiring access to a library and the employment of workers familiar with medical nomenclature and fluent in foreign languages. To be sure, it is a difficult task, which, however, is most rewarding because it is appreciated.

GEORGE HALPERIN, M.D., F.I.C.S.
Chicago, Illinois

The Art of Treating Shock

THE art of medicine, the application of the medical knowledge of the time, has prevailed from the Stone Age medicine man to Hippocrates and to Osler. Patient gentleness was integrated with military surgery when Florence Nightingale in the Crimean War and Clara Barton in the American Civil War pressed on to the battle field. Their work led to more efficient medical services in the armies of Britain and America.

The most important military medical service today is the treatment of injury. Outstanding in the treatment of acute injury is the management of traumatic shock. The stress of injury may be aggravated by fear, pain and exposure to cold. There is an early endocrine phase (Moore) or alarm reaction (Selye). The severity of the stresses and variations of response to stress determine what the physician should do. An outpouring of steroid hor-

mones from the pituitary-adrenal axis produces numerous and complex effects. On the whole, their action contributes to survival. With the absence (in the experimental animal) of either the pituitary or the adrenal gland, or with drug-induced adrenocortical atrophy, minor stresses are fatal. If, in cases of severe injury, early treatment overlooks the endocrine mechanism, the survival rate may be reduced. The multiple theories of shock make it difficult to establish a universal standard procedure. The superior benefits of immediate definitive treatment for moderate injury have come about by means of the supportive therapy that protects the patient against the added burden of active treatment. A habit of zeal for early treatment of severe multiple injuries is better avoided; shock can be irreversible. That inadvertent iatrogenic mortality from injury may occur is probable.

In an evacuation hospital in World War II it was observed that the prisoners, who came last to the operating room, were doing better than the others. When the procedure was reversed and the war prisoners were taken to the operating room first, it was noted again that the group who came into the operating room last had the improved results. The adrenergic-corticoid (endocrine) response to stress will reach a peak, and if much therapeutic handling follows the peak goes higher and upgrades the severity of the trauma. It is ironic that the physiologic response to noxious stimulation may be so severe that its additional damage is even greater than the original injury. Laborit tried to block this untoward response with his lytic cocktail of thorazine, phenergan and demerol to produce hibernation. Some clinicians use the first hours after injury to relieve pain in their patients and then "let them lie," with favorable results.

Studies of the interval between the time of wounding and the beginning of treatment show that between four and eight hours there is a progressive increment in the mortality rate, but survival rates for each hour during the first four hours are equivalent. The impulse of the trained resident to perform an operation for cure of the severely injured patient is difficult to resist; yet devoting the first four hours to shock therapy and letting the physiologic response spend itself can be life-saving. Therapy becomes more skilled by the addition of science, and the physician must integrate many scientific principles in his work.

In the recent Korean conflict, shock teams discovered that tissue fluid from wounds of the extremities had a lower protein content than tissue fluid from wounds of the trunk. One nation's surgeons, operating in a hot, dry area, pack wounds of the extremities in ice and first give definitive treatment to wounds of the trunk. Such a procedure lessens shock. Experiments have shown that the optimum cutaneous temperature for survival after injury is 72 F.; results are less good at a temperature of 40 F. and even worse at a temperature of about 98 F. The stress of temperature extremes adds to the physiologic burden. High cutaneous temperature includes an increase of the untoward injury response in the target area.

In the treatment of shock, blood transfusion has become so standard that it seems needlessly used at times. Blood alone does not always solve the problem; the symptomatic control of a persistent fall in blood pressure by administering norepinephrine has been found useful. Plasma has been replaced by plasma volume expanders, such as dextran, PVP and gelatin. These should some day be replaced by a physiologic plasma volume expander, which is theoretically possible. An expander is simply macromolecular material that resists osmosis from the vascular space; the gel-like intercellular substance of the inter-

stitial space (mucopolysaccharides) may yet be synthesized for parenteral use.

The intercellular substance carries electrolytes and other materials between the cell and the vascular space. It changes actively in the presence of shock, increasing capillary permeability to allow fluid elements of the blood to migrate to the interstitial space. The survival value of shock is derived from the protection against blood loss by diminished blood flow and blood pressure. Since overstimulation of such a mechanism may be lethal, avoiding additional stimulation by conservative treatment may be life-saving. In cases of moderate injury, early definitive care with supportive therapy produces better results than does unaided Nature; but where there is severe multiple injury, with the problem of irreversible shock, proper timing and dividing the definitive treatment into stages will aid Nature and show a certain art in the management of shock therapy.

During the first four hours the delay of active treatment, while there is doubt, is not damaging. This time must be used for the control of fluid and circulatory balance and for accurate diagnosis. On admission the patient is put on a shock stretcher, from which he is not moved until definitive treatment is started. Roentgen plates may be slipped under the patient without lifting him, the only change of position required being that needed for taking a lateral decubitus film. Injuries to the extremities may be bandaged with elastic bandage or packed in ice and ignored until questions concerning the body cavities are settled. A needle is placed in a vein and kept open with saline solution or plasma volume expander in slow drip and a blood pressure cuff applied.

The absence of external wounds about the head, chest or abdomen offers no security as to the intactness of body cavities. Increasing intracranial pressure may occur without fracture of the skull; the pupils and the state of consciousness are observed and recorded. Restlessness and excitement go with cerebral damage; apathy goes with traumatic shock. Respiratory difficulty in the presence of an adequate airway may mean hemothorax or tension pneumothorax. Self-reduced rib fractures may have produced torn lungs.

Fluid losses from natural body orifices and wounds must be assessed as to significance. A catheter in the bladder should be routine. Intestinal rupture by blunt blows to the trunk must be kept in mind. The shock wave transmitted to the intestines expends itself like a whiplash where the bowel hangs loose from a mesentery, but where the bowel is fixed to the abdominal wall, as in a hernial sac with an adhesion, or at the ligament of Treitz, it may be ruptured.

Copious serum fluid loss, as with extensive burns, should be replaced by plasma or its equivalent. Serum flowing from the anus may be a sign of peritoneal exudate decompressing itself through a ruptured bowel. If the patient has not been handled during the golden period, his shock should be controlled. Persistent signs of shock, such as an elevated pulse rate, must then be attributed not to nonspecific traumatic shock but to some specific entity, such as peritonitis, calling for definitive treatment.

If a clinical scoreboard kept during a period of shock therapy shows that the cavities of the head and trunk are homeostatic or under clinical control, injury to the extremities may then be attacked. This may often be done promptly, but in cases of severe multiple injury, if the immediate handling of the patient is so gentle that shock cannot be attributed to handling, an accurate diagnosis should be established within the four-hour period.

SIDNEY VERNON,
M.D., F.A.C.S., F.I.C.S.
Willimantic, Connecticut

New Books

Books Received.—The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

The Doctor's Legacy. *Edited by Laurence* Farmer. New York: Harper & Brothers, Publishers, 1955. Pp. 267. *Reviewed in this issue.*

Sachs Essays. By Ernest Sachs. Hamden, Connecticut: The Shoe String Press, 1955. Pp. 118, with frontispiece (portrait of author).

The Cervical Syndrome. By Ruth Jackson. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 130. *Reviewed in this issue.*

Blood Volume Determinations in Surgical Practice. By Olla Wiklander. Acta Chirurgica Scandinavisa Supplementum 208. Stockholm: Acta Chirurgica, 1956. Pp. 136, with 10 illustrations and 37 tables. *Reviewed in this issue.*

Handbook of Physical Therapy. By Robert Shestack. New York: Springer Publishing Company, Inc., 1956. Pp. 212.

Les Thromboses de la Carotide Interne et de Ses Branches (Thromboses of the Internal Carotid and Its Branches). By J. Paillas and L. Christophe. Paris: Masson et Cie, 1955. Pp. 108. *Reviewed in this issue.*

Fractures of the Facial Skeleton. By N. L. Rowe and H. C. Killey. Baltimore: The Williams and Wilkins Company, 1955. *Reviewed in this issue.*

Les Traumatismes Cranio-Cerebraux Fermes Recents (Recent Closed Cranial and Cerebral Injuries). By L. Mamsuy and J. LeCuire. Paris: Masson et Cie, 1955. Pp. 122. *Reviewed in this issue.*

Pulmonary Uptake of Oxygen, Acid-Base Metabolism and Circulation During Profound Apnea. By Martin H-son Holmdahl. Stockholm, Sweden: Acta Chirurgica Scandinavica Supplementum 212, 1956. Pp. 128, with 36 illustrations.

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 374, with 145 illustrations.

Tumors of the Skin. By Herbert Conway. Springfield, Ill. Charles C Thomas, Publisher, 1956. Pp. 267, with 178 illustrations, 3 in color.

Studies in Anemia of Injury. By Lars-Eric Gelin. Stockholm, Sweden: Acta Chirurgica Scandinavica Supplementum 210, 1956. Pp. 130, with 58 illustrations.

Supplement 1, Atlas of Exfoliative Cytology. By George N. Papanicolaou. Cambridge, Mass.: Harvard University Press, 1956. Looseleaf format, published for The Commonwealth Fund.

A Short Practice of Surgery. By Hamilton Bailey and R. J. McNeill Love, with chapters by John Charnley, William P. Cleland and Geoffrey Knight. London H. K. Lewis & Co., 1956. Pp. 1126, with 1411 illustrations, 271 in color. *Reviewed in this issue.*

Campbell's Operative Orthopaedics. By J. S. Speed and R. A. Knight. St. Louis: The C. V. Mosby Company, 1956. 3d ed. *Reviewed in this issue.*

Surgical Diagnosis. By Philip Thorek. Philadelphia: The J. B. Lippincott Company, 1956. Pp. 320, with 291 illustrations. *Reviewed in this issue.*

Operative Technic. Edited by Warren H. Cole. New York: Appleton-Century-Crofts, Inc., 1956, 2d ed. *Reviewed in this issue.*

A Short Practice of Surgery. By Hamilton Bailey and R J McNeill Love, with chapters by John Charnley, William P Cleland and Geoffrey Knight London H K Lewis & Co, 1956 Pp 1126, with 1411 illustrations, 271 in color

Those who remember Mr Hamilton Bailey's extraordinary *Demonstrations of Physical Signs in Clinical Surgery*—and we doubt that anyone who read it has forgotten it—will not be surprised at the excellence of the present work Both Mr Bailey and Mr Love are among Britain's most distinguished surgeons Their three collaborators, like themselves, are Fellows of the Royal College of Surgeons, and the marks of high ability and integrity are apparent on every page of this volume Particularly striking, as in Mr Bailey's book on physical signs, is the quality of the color plates, which reproduce with almost incredible faithfulness the various pathologic lesions as they appear in life

The textual matter is remarkable above all for its conciseness, which is achieved without the omission of any relevant detail There are fifty chapters, each complete in itself, and no significant area of surgical therapy is neglected Each disease or lesion or trauma is defined, described and illustrated, the symptoms and signs are listed, the pathologic picture is presented, the treatment is outlined, together with the indications and contraindications for surgical intervention So clearly and specifically is all this information given that even a layman, however little versed in medical terminology, could scarcely fail to understand it This opens a question of considerable academic interest Do many, or even most, of our medical and surgical textbooks rely too heavily on learned language, which in any profession tends, with overuse, to become jargon? One who reads this book will certainly have that impression The learning of these authors and the soundness of their approach are self-evident and need no further demonstration than their own clarity, for clear expression is invariably a sign of clear thinking Open the book at random, and almost any paragraph that may catch the eye (excluding histopathologic descriptions) will be found as lucid and uncluttered as the best secular writing, e g, an unselected passage on page 134, on the treatment of ranula "A difficulty hindering ideal treatment is that the cyst bursts before dissection can be completed If some of the fluid within the cyst can be aspirated before commencing enucleation, complete dissection is usually possible Often, however, the contents are of the consistency of jelly, and will flow through a hollow needle" Note that the cyst does not "become a complication of surgery through its not infrequent rupture prior to completion of the technic", it simply bursts before dissection can be completed What relief is in this economy of expression, Note also, in the paragraph quoted, that only three words—"dissection," "enucleation' and "aspirated"—can possibly be classified as technical, the first two have familiar meanings outside the field of surgery as well as within it, and the meaning of "aspirated" can be deduced from the context by any intelligent reader Note, finally, the simple and sufficient use of the word "before" rather than "prior to," "previous to," "preliminary to" or "in advance of" Had the book no other excellence, the pattern it provides of good unpretentious scientific writing would also justify its publication

Needless to say, it has many other excellencies It will undoubtedly be received with confident enthusiasm by those who are familiar with earlier publications of the authors, and will open new fields of interest to those who are not It is equally valuable as a textbook and as a work of reference Whatever information one seeks will be easily found, such a book, in fact, could appear without an index and this would still be true There is, however, an index, and a good one References to the literature, where these are apposite, are supplied in footnotes, but here again discrimination is apparent, there is no attempt to compile long bibliographic lists of the kind so often published, one suspects, more for the sake of making a scholarly impression than because of actual need Their value in works of research and theory is unquestionable, but in a book of this kind, which is practical throughout, the authors do well to rely chiefly upon their own knowledge and experience The reader is thus left free to react as he will, to match his own opinions with the authors' and to form new opinions stimulated by suggestion, whereas, if he were confronted with column after column of references, the mere

weight of so much implied authority might baffle the impulse toward further thinking.

This book, in fact, of its kind, approaches perfection. Much of great value can be learned from it, and it is surely far from disparaging to say that the task of learning is made delightfully easy.

M. T.

Surgical Diagnosis. By Philip Thorek. Philadelphia: The J. B. Lippincott Company, 1956. Pp. 320, with 291 illustrations.

This book on surgical diagnosis is an excellent contribution to the teaching of the subject to undergraduate medical students, interns and residents, although it could be reviewed with profit by the experienced surgeon. There are several salient points that commend it. Among them is its brevity, considering the subject treated. No attempt is made to present an exhaustive treatise on the subject, which in itself would be a disadvantage. Instead, only the salient features of the field are presented. Probably the most outstanding feature of the work is the illustrations, which permit the author to make his point very clearly and thus economize the reader's time and mental effort. Excellent illustrations are always superior to verbal descriptions, and this book abounds with such illustrations. Not inconsequential is the high grade of the paper, the physical make-up and the large print. The limited size of the volume is also a great advantage.

Undergraduate students, interns and residents should have access to this work for preparation of their courses, examinations, state boards, etc., but also for frequent consultation in connection with their actual work with patients. For the surgeon engaged in teaching younger men it is an excellent work to have at hand.

ALEXANDER BRUNSCHWIG, M.D.

Blood Volume Determinations in Surgical Practice: A Comparative Analysis of the Evans Blue Dye Method, the Radioactive Phosphorus Method and the Alveolar CO Method, with Special Reference to Determinations under Pre- and Postoperative Conditions. By Olle Wiklander. Stockholm: Acta Scand. Supplement 208, 1956. Pp. 136, with 10 illustrations and 37 tables.

A brief survey is presented of various methods used to determine the blood volume, after which the author describes accurately the Evans blue method, the radioactive phosphorus method and the alveolar carbon monoxide method. The three methods, as employed preoperatively and postoperatively, are compared.

The author concludes that the three methods have about equal value, intrinsically, i.e., considered merely as methods. Certain biologic errors are present, but these can be overlooked. The alveolar carbon monoxide method is not recommended for postoperative use, because of the uptake of carbon monoxide by extravasated blood in the operative field.

For practical purposes the Evans blue method is recommended, as it can be performed simply in the course of routine laboratory work. The radioactive phosphorus method, of course, requires special equipment and, when used routinely in active surgical hospitals, requires numerous Geiger counters. The alveolar carbon monoxide method, which has the advantage of eliminating venipuncture, is rather cumbersome, and its use should be restricted to research laboratories.

The entire dissertation is well written and logically organized. It is a valuable contribution to the technical study of blood volume determination.

WERNER F. EISENSTAEDT, M.D.

Operative Technic. Edited by Warren H. Cole. New York: Appleton-Century-Crofts, Inc., 1956, 2d ed.

The second edition of a textbook that made an unmistakable impact on the surgical literature on its first appearance is sure of a hearty welcome. Dr. Cole's outstanding compendium on the surgical specialties reaches, in this new edition, an even higher level of excellence than did the original.

As Editor, Dr. Cole neither can deny nor wishes to deny the immense and increasing importance of specialization. Despite this recognition and appreciation, however, he has never lost sight of the importance of general practice. "Specialism," he observes in his preface, "cannot be avoided if the surgical profession is to develop talent of the highest type, because the surgical field is becoming too broad for any man to become proficient in more than one or two of its branches. . . We should nevertheless insist that in his training period the specialist should have a significant exposure to general surgery and that the general surgeon should have training in more than one or two specialties."

In the new edition the section on cardiovascular surgery, a field in which tremendous strides have been made in recent years, there are six separate divisions the blood vessels, the heart and pericardium (exclusive of congenital and valvular lesions), congenital malformations of the heart and great vessels, cardiac septal defects, open cardiotomy, hypothermia and the heart lung machine, intracardiac operation for acquired valvular disease, and the surgical treatment of portal hypertension Similarly, the neurosurgical section is subdivided into separate discussions of the autonomic nervous system, the peripheral nerves, the scalp, cranium and brain, the spinal cord, and the cranial nerves, as is the orthopedic section into chapters on fractures, deformities and neoplasms of bone, hematogenous osteomyelitis, surgical approaches to the joints and the orthopedic surgical treatment of spastic paralysis and anterior poliomyelitis Sections that do not require such diverse classification, such as those on thoracic surgery, plastic surgery, gynecology and obstetrics, genitourinary surgery, and the surgical treatment of the face, mouth, jaws and neck, are nevertheless dealt with in the most meticulous detail Each of the contributors is prominent as a specialist in his field

One of the most striking characteristics of Dr Cole's compendium is its absolute modernity Surgical procedures no longer in general use are not included, at the same time, no new procedures are introduced unless they have proved their value The same principle of true economy, in the best sense of that much abused word, has been followed in selecting the illustrations, none of which are unimportant, irrelevant or redundant, and all of which are admirably reproduced

This reviewer is in complete agreement with Dr Allen O Whipple, who contributes the Introduction, when he observes "Few surgical treatises give so valuable and detailed information on operative procedures in the field of the locomotor and skeletal systems" The same is true of the sections on cardiovascular and neurologic surgery, and, indeed of the work throughout

It is a common error to suppose that the production of a collaborative work of this kind is a sinecure for the editor thereof Nothing could be further from the truth From the selection of the collaborators to the organization and final appearance of the text the editor's guiding hand must be strong and sure It is his task and his responsibility to see to it that no incongruity and no repetition shall mar the work as a finished product Dr Cole's skill in this direction was plainly attested by the first edition of *Operative Technic*, by the second, it is placed beyond all question

M T

Campbell's Operative Orthopaedics By J S Speed and R A Knight St Louis The C V Mosby Company, 1956 3d ed

This two volume third edition of *Campbell's Operative Orthopaedics* is an encyclopedia of orthopedic surgery, with emphasis upon the technic of each operation The original *Campbell's Operative Orthopaedics* was a single volume, edited by Dr Willis Campbell with the assistance of various members of his clinic staff in Memphis, Tennessee This third edition is edited by Drs James Spencer Speed and Robert A Knight of the Campbell Clinic Various members of the Faculty of the College of Medicine of the University of Tennessee have contributed sections or chapters Chapters or portions of chapters were written by Otto E Olfunk of Boston, Massachusetts visiting Orthopedic Surgeon at Massachusetts General Hospital, Boston, and Instructor in Orthopedic Surgery, Harvard Medical School Dr James D Hardy of Memphis, Tennessee, Professor and Head of the Department of Surgery of the University of Mississippi School of Medicine, Dr Francis Murphey of Memphis, Tennessee, Associate Professor of Neuro-Surgery, University of Tennessee College of Medicine, Dr H B Slocum of Eugene, Oregon Chief of the Orthopaedic Section of the Sacred Heart General Hospital, Eugene, and Branch Consultant in Orthopaedic Surgery of the United States Veterans Administration

A new chapter on Surgical Physiology, written by Dr James D Hardy, has been added The chapter dealing with surgical approaches as well as that on both recent and old fractures has been extensively revised, more illustrative material has been incorporated, and new technics widely used today in the treatment of these conditions are included This includes intramedullary fixation of fractures of the long bones and prosthetic replacement arthroplasties Other chapters that have been extensively revised or completely rewritten include those on surgical treatment of the peripheral nerves, amputation, the management of lesions of the intervertebral discs and the treatment of skeletal tuberculosis

Many of the illustrations used in the two volumes are line drawings, clear and easy to understand. Photographs are used wherever these can tell the story more effectively than can an artist's drawing.

The text is easy to read and easy to understand. The work deserves a place in the world orthopedic literature comparable to that occupied by the two-volume *Fractures and other Traumatic Injuries,* edited by Sir Reginald Watson-Jones. These books will not be of great use to the medical student or the doctor in general practice. They are intended for, and will be used by, orthopedic surgeons and the teachers of orthopedic surgery throughout the world.

EDWARD L. COMPERE, M.D.

The Doctor's Legacy. Edited by Laurence Farmer. New York: Harper & Brothers, Publishers, 1955. Pp. 267.

As a basis for the intimate exploration of personality, nothing can be more revealing than letters, particularly private letters, of the person under scrutiny. In this collection of letters and excerpts from letters written by more than eighty physicians and surgeons from the most famous to the unidentified, Dr. Farmer offers a fascinating series of revelations. The book vibrates with the impact of personalities, in some instances so strongly contrasted as to reemphasize the infinite variety that may exist among members not only of the same race but of the same profession. Two such contrasting opinions of the profession itself, expressed by John Coakley Lettsom of London and the redoubtable Benjamin Rush of Philadelphia, are striking indeed. "Medicine," writes the gentle Lettsom, "is the highest and most divine profession that can engage the human intellect . . . I have no objection to die in the chamber of malady, provided I can mitigate it in a fellow creature—*and so every other physician would, I doubt not, reason.*" And Rush? "I wish," he writes to a friend, also a physician, "that a society could be formed to *humanize* doctors. General Lee once said, 'Oh! that I were a dog, that I might not call man a brother!' With how much more reason might I say, 'Oh! that I were a member of any other profession . . . that I might not call physicians my brethren!'" Lettsom says that medicine is not lucrative, being above all considerations of money; Rush, as early as 1812, was writing, "Let us throw the whole odium of the hostility of physicians to each other upon their competition for business and money."

Throughout the book, the struggle to maintain high ethical standards in the face of self-interested competition, sometimes disastrously powerful, is apparent. In the letters of the higher-minded among the doctors a note of deep melancholy is often heard, as in a letter of Jenner's: "Vaccination will go on just as well when I am dead as it does during my existence, probably better, for one obstacle will die with me—Envy."

Indignation of the finer sort is also abundant, as in Sir James Simpson's letter on anesthesia: "Imlach tells me Dr. P. is to enlighten your medical society about the 'morality' of the practice. I have a great itching to run up and pound him. *When* is the meeting? . . . The true moral question is, 'Is a practitioner justified by *any* principles of humanity in not using it?' I believe every operation without it is just a piece of the most deliberate and cold-blooded *cruelty.*"

Since doctors are also human beings, there are many glimpses and sidelights on their personal lives and family relations as well as on their divertingly varied attitudes toward the medical controversies of their times—vaccination, anesthesia, asepsis, vivisection, and all the other moot questions, down to the still active controversial issues of psychoanalysis and euthanasia. The book covers a span of more than two centuries, from 1721 to 1953. Whatever can be said about the progress of medicine and surgery, this book reemphasizes a fact well known to every member of the profession: that it is one sphere of human life in which there is never a dull moment. A physician or surgeon bored with the life he leads is a rare if not nonexistent phenomenon. Despite the frustrations and handicaps, the weariness of human folly, the natural impatience of intelligence with stupidity and superstition these letters reveal, the final impression they leave is one of great satisfaction: it is a pretty good way of life we have chosen, after all!

M. T.

Les Traumatismes Craniocerebraux Fermes Recents (Treatment of Recent Closed Head Injuries). By L. Mansuy and J. Lecuire. Paris: Masson et Cie, 1955, Pp. 122.

This monograph deals only with closed injuries of the head and their management for the first fifteen days after the injury. The criteria for inclusion of cases were (1) fracture

of the skull verified by roentgen ray or at operation, (2) genuine loss of consciousness, or (3) the early appearance of neuropathic signs of injury to the brain The study is based on 3,110 cases, a rather heterogenous group transferred or referred to Prof Wertheimer's surgical clinic between May 1, 1934 and Jan 1, 1955 The authors admit, as the reader would suspect, that the earlier case histories have little value

The subject of closed head injuries is treated in the orderly and logical fashion that one expects of French authors The value of electroencephalographic and angiographic changes is extensively discussed Surgical intervention is recommended only for depressed skull fracture, extradural and subdural hematoma, intracerebral hematoma and certain fractures involving the frontal sinuses The authors emphasize the importance of careful examination and observation, as well as the employment of experienced clinical judgment, in the evaluation of the injured patient's condition

The overall mortality rate in the 3,110 cases was 8 7 per cent Operation was performed on 246 patients, approximately 8 per cent of the total In this group the mortality rate was 39 per cent This is partly explained by the high mortality rate (50 per cent) among the 62 patients with hematomas who were operated on Many of these patients had severe associated injury to the brain as well as an extradural or subdural hematoma It is surprising that they operated on 36 patients with extradural hematoma in contrast to 25 in whom the hematoma was subdural Although the monograph is limited to the first fifteen days after the injury, it is the experience of this reviewer that even in this early period subdural hematoma is encountered more frequently than is the extradural type

This monograph offers little that is new in the management of inquries to the head The cases cover such a long period that it is difficult to compare the results with those reported for other large series of cases The text is well written however, and will have its own value to the general surgeon or physician who is called on to treat cranial and cerebral injuries

HAROLD C VORIS M D

The Cervical Syndrome By Ruth Jackson Springfield, Ill Charles C Thomas, Publisher, 1956 Pp 130, with 50 illustrations

This small textbook in seven chapters would be a worthy addition to the library of any orthopedic or neurologic surgeon Starting logically with a review of the cervical anatomic background, the author proceeds to discuss the various mechanisms through which the cervical nerve roots may be irritated There is a good chapter on diagnosis and differential diagnosis, and the closing portion of the book offers many suggestions as to treatment A number of good references are included

The roentgenograms and line drawings illustrating the text are excellent and well reproduced, and the book is attractive in type and makeup The reader will find its perusal well worth the time it takes

H E TURNER, M D

Les Thromboses de la Carotide Interne et de ses Branches (Thrombosis of the Internal Carotid Artery and its Branches By J Paillas and L Christophe Paris Masson et Cie, 1955 Pp 108, with 25 illustrations

This monograph deals with thrombosis of the internal carotid artery and its principal branches, the middle cerebral and anterior cerebral arteries Only occlusions of the first parts of the latter arteries are included Thrombosis of smaller cerebral arteries is not considered The clinical observations are based on 51 cases, 39 of thrombosis of the internal carotid and 12 of thrombosis at the point of origin of its two main branches The male predominated over the female in the ratio of 3 to 1 among the 39 patients with internal carotid thrombosis, and 30 of the 39 patients were between 40 and 60 years of age

Etiologic factors and the gross and microscopic pathologic picture are briefly considered The clinical features are discussed in detail, especially the modes of onset Angiographic study is essential in the diagnosis This section of the monograph is particularly well illustrated Electroencephalographic studies are presented in considerable detail, especially in connection with the "carotid signs"—i e, the effects of compression of the opposite carotid in patients with thrombosis of the internal carotid Such compression within ten to thirty seconds will produce general malaise, jacksonian seizures and finally loss of consciousness The results of this contralateral compression of the carotid thrombosis are compared with those of similar compression in patients with hy-

persensitivity of the carotid sinus and in normal persons.

The reasons for the development of neural signs and symptoms in patients with thrombosis of the internal carotid artery are given as (1) insufficiency of the collateral circulation through the polygon of Willis; (2) extension of the thrombosis to involve the branches of the internal carotid artery; (3) associated independent thrombosis of the cerebral vessels; (4) cerebral embolism from the thrombus, and (5) spasm of cerebral vessels.

Surgical treatment is discussed at some length. In the author's series it generally consisted of arteriectomy, combined with some form of cervical sympathectomy, or of sympathectomy alone. The results of surgical treatment are not remarkable but appear to justify its use.

The 51 cases are analyzed in two tables. There are twenty-five illustrations. This monograph will be important to everyone interested in carotid thrombosis, a subject that has been neglected until recently.

HAROLD C. VORIS, M.D.

Fractures of the Facial Skeleton. By N. L. Rowe and H. C. Killey. Baltimore: The Williams and Wilkins Company, 1955. Pp. 923. Illustrated.

This volume of 923 pages of text, with appropriately selected and beautifully reproduced illustrations, is encyclopedic in the thoroughness with which all of the subject material is covered. It is a reference book rather than a textbook.

The authors are eminently qualified to speak with authority when discussing fractures of the facial skeleton. Both are Consultants in Oral Surgery of the Plastic and Maxillofacial Surgery Unit, Rooksdown House, Basingstoke, Hants; Honorary Civilian Lecturers in Maxillofacial Injuries for the Depot and Training Establishment of the Royal Army Dental Corps, Aldershot, Hants; and Mr. Rowe is Cilivian Consultant Dental Surgeon to the Royal Navy.

In the preface, the authors state that this book was written to provide a comprehensive textbook on fractures of the facial skeleton in a manner that would be acceptable to the orthopedic surgeon, the dental surgeon and the specialist in maxillofacial surgery. They have accomplished exactly that. The organization of the book and the splendid manner in which it is written reflect great distinction upon these two authors. The good judgment they have shown in the selection of contributors is also noteworthy. Chapters were written by Patrick Clarkson, G. E. Ennis, D. T. Gilchrist, Sir Harold Gillies, W. G. Holdsworth, C. R. McCash, G. Romanes and F. A. Walker. Each of these men is exceptionally well qualified to discuss the subject matter assigned to him.

The foreword to the book was written by Sir Reginald Watson-Jones, who predicts that this volume "will be read many times, in many editions, not only in this country but in France, Italy, Germany, Latin-America, French Canada and elsewhere throughout the world." This is a book which will be referred to and quoted by those who are concerned with the problem of maxillofacial surgery during our lifetime and for generations to come.

EDWARD L. COMPERE, M.D.

Abstracts from Current Literature

Histologic Changes in the Uterine Cervix During Pregnancy and the Diagnosis of Carcinoma in Situ. Campos, J., and Soihet, C. Surg., Gynec. & Obst. 102:427, 1956.

The authors studied the histologic structure of the cervices of 200 pregnant women. These studies were made by means of multiple biopsies before or immediately after labor. If abnormalities were present, specimens were taken for repeat biopsies six and twelve weeks after labor.

The histologic lesions were observed histologically and are described in detail. In 10 cases the histologic alterations were indistinguishable from those of carcinoma *in situ*. In all cases, however, these alterations had disappeared by the twelfth postpartum week. It was thus concluded that morphologic alterations in the cervix during pregnancy are the result of pregnancy *per se*.

This study shows that it is difficult or impossible to diagnose carcinoma *in situ* during pregnancy with certainty and that, if carcinoma *in situ* is to be distinguisable from transitory changes due to pregnancy, prolonged follow-up after delivery is essential.

EDMUND LISSACK, M.D.

***Résultats lointains de la Gastrectomie pour* ulcère gastrique et duodénal (Long-Term Results of Gastrectomy for Gastric and Duodenal Ulcer).** Welti, H.; Mondet, G., and Schneider, S., Presse Méd. 63:1089, 1955.

The authors present a study of 171 gastrectomies performed by the same surgeon using the same technic. No operation was undertaken until all medical treatment had failed. In all cases the gastrectomy was a large two-thirds removal, with an oblique line of section. Anastomosis was assured by the retrocolic Polya method. Three-layer sutures were used.

Of the 171 cases, the ulcer was gastric in 74 (50 ulcers of the lesser curvature, 22 of of the pylorus and 2 of the greater curvature) and duodenal in 97. Of the latter, the duodenal ulcer was removed with the stomach in 79 cases, while in 18 its resection was impossible.

It is pointed out that results depend essentially on the quality and care of the surgeon. Otherwise, technics are more or less standardized.

The postoperative mortality rate was 1.7 per cent (2 out of 171). Seventy per cent (118) were follow up by clinical, radiologic and laboratory examinations. In the estimation of results, 92 (78 per cent) are classified as excellent, 16 (14 per cent) as medium and 10 (8 per cent) as bad. Three patients of the last-mentioned group were reoperated on, with satisfactory results.

The poor results can be divided as follows: 2 cases of recurrent duodenal ulcer, 6 cases of the dumping syndrome and one aggravation of a preexisting tuberculous lesion.

No relation was observed between the patient's age at operation and the late results.

Whenever possible, it is important to remove the duodenal ulcer, the authors' poor results having been particularly noted in the cases in which only a by-passing gastrectomy was done.

The aim of this article is to underline the high proportion of good results. Some surgeons will find themselves in disagreement with the optimistic view taken.

S. A. GUEUKDJIAN, M.D.

The Use of Intravenous Cholangiocholecystography in the Diagnosis of Acute Conditions of the Abdomen. Jordan, P. H., Surg., Gynec. & Obst. 102:218, 1956.

Cholografin provides the clinician with the means of obtaining a cholangiocholecystogram within two hours. Although this agent offers a new approach to the pathologic and physiologic character of the biliary system, certain disadvantages remain. Despite the absence of serious reactions in the author's series, intravenous administration of a compound with such a high iodine content may be expected eventually to produce serious complications. The high contrast [illegible]en technic used to provide sufficient interpretation is safe but must b cautiously, since each exposure 4 roentgens to the skin.

The author's study involved taking roentgenograms at specific intervals after injection. Each film was developed before the next exposure was made, in order to correct the technic or terminate the examination when the desired information had been obtained.

The density of the shadow cast by cholografin in the common duct paralleled that observed in the gallbladder. Occasionally these were faint and difficult to evaluate. In contradiction of other reports, correlation of the density of the dye in the gallbladder with the concentrating function of the latter was not possible. Although cholografin is particularly suitable for cholangiographic study, it cannot be utilized for routine cholecystographic procedures. Its density makes concentration by the gallbladder unnecessary to produce visualization, thereby making evaluation of the concentrating function of this organ virtually impossible. Not infrequently, however, the question is raised as to whether a patient with a nonfunctioning gallbladder actually absorbs the contrast medium from the gastrointestinal tract. Cholografin is helpful to these particular patients if calculi are outlined or if obstruction of the cystic duct permits visualization of the common duct only.

Despite its disadvantages, cholografin has distinct advantages and diagnostic potentialities. Its primary importance lies in the fact that it provides a dependable nonoperative method of obtaining a cholangiogram consistently, even in the absence of the gallbladder.

WILLIAM E. NORTH, M.D.

Quelques aspects morphologiques de la sclérose du tissu adipeux: Son importance dans la fibroadénose du sein (Certain Morphologic Aspects of Sclerosis of Adipose Tissue: Its Importance in Fibroadenosis of the Breast). Rast, J. P., Presse Méd. 64:139, 1956.

Although the histologic structure of adipose tissue has been adequately described, its blood supply remains less well known. It is certain that it has a rich vascular system, but it is surprising to note that this system may be as rich as that of muscle. Narrow arteries part from branches that irrigate many lobules at a time. Terminal rami form a polygonal network surrounding one or many cells.

Intracardiac and intra-arterial injections of China ink show a closed vascular system, encircling the fat cells and connecting the sinusoid spaces. These vessels have been called "dormant intersinusoidal capillaries" by Doan, while those the author's laboratories (Prof. Rutishauser) prefer to name them "intercytal capillaries." Often the capillary occupies the whole of the intercellular space, and one cannot distinguish its very thin wall from that of the adjoining cells. These capillaries have a considerable capacity for dilatation and filling. They can even be a source of hematopoiesis.

After these physiologic considerations of the blood supply of adipose tissue, the author discusses the importance of this vascular network in sclerosis of adipose tissue, as exemplified by chronic fibroadenosis of the breast. This condition is characterized by general proliferation of the acini and especially by a considerable infiltration of fatty tissue by hyaline tissue—a rich albuminous transudate from the capillaries, which become dilated and (temporarily) abnormally permeable.

The author has studied particularly the evolution of sclerosis in adipose tissue. The first phenomenon that strikes the eye is the general confusion of the two types of connective tissue of the breast: the intralobular, rich in cells, poor in collagen fibers, and the interlobular, a denser structure.

It is noted that adipose tissue possesses, in all its localizations, the same fine, rich and highly developed vascular system, which plays a great rôle in its pathologic changes.

In the liposclerosis of mammary fibroadenoma, the intercytal capillaries dilate at the beginning, become abnormally permeable to certain hyalogenous proteins and later, disappear at the periphery of the gland, to become, at a still more advanced stage, completely unrecognizable. It is possible that this ischemia might be the cause of lysis of the constituted fibers. This point is worth investigating further.

Excellent photomicrographs and an extensive bibliography enrich this well-written paper.

S. A. GUEUKDJIAN, M.D.

Carcinoma of the Stomach: A Seven-Year Review. Sanabria, J. F., Bol de la A. M. de Puerto Rico 47:279, 1955.

A study of 41 cases of carcinoma of the stomach treated in the Department of Sur-

gery at San Juan City Hospital was presented in December 1953, and the present review adds 36 cases observed from July 1, 1947 to Oct 4, 1954

The operability rate was 98 7 per cent, the resectability rate, 3 9 per cent, and the palliative operability rate, 64 per cent Of the gastrectomies performed, 26 5 per cent were total and 73 5 per cent subtotal The mortality rate for gastrectomized and nongastrectomized patients was 14 3 per cent for each group, with the same percentage of overall mortality Patients who could not be followed up were classified as having died of carcinoma The final results were as follows

Nine patients underwent operation five years or more prior to the time of writing Of these, 4 lived more than five years, the five-year survival rate in determinable cases being 44 per cent Of the remaining patients, 19 lived more than one year, 8, more than two years, 3, more than three years, and 2, more than four years

Apparently there is an increase in the incidence of carcinoma of the stomach, with a male-female ratio of 2 1 The peak incidence occurs between the ages of 22 and 86, with preponderance in the seventh decade of life

Epigastric distress was the most common symptom and had usually been present for one and a half to eight years Next in order were epigastric pain, dysphagia, hematemesis, a mass in the right upper abdominal quadrant, nausea, vomiting, epigastric pain associated with pain in the right upper quadrant, pain in the left upper quadrant, vomiting with diarrhea, diarrhea with tarry stools, anorexia and loss of weight Obvious loss of weight was observed in 47 patients In 42 the value for hemoglobin was below 10 Gm per hundred cubic centimeters Of 33 patients who underwent gastric analysis with histamine stimulation, 15 showed achlorhydria, 7, hypochlorhydria, 3, hyperchlorhydria, and the remainder a normal response Positive results from benzidine tests for occult blood in the gastric contents were obtained in 60 6 per cent, and 40 per cent of the patients tested for occult blood in the stools gave a positive reaction

Roentgen study indicated tumor of the antrum in 54 5 per cent of the cases, of the pylorus in 10 4 per cent, of the body of the stomach, in 9 per cent, and of the cardia, 13 per cent Five patients with a roentgen diagnosis of carcinoma of the cardia were examined esophagoscopically, and biopsy was performed in the cases of 4 of them, with negative results

Operative complications included dehiscence of the wound in 1 case, ascites requiring repeated paracentesis in 2, left pleural effusion in 1, and acute glomerulonephritis, bronchopneumonia and partial dehiscence in 1 With the gastrectomized patients, the complications included bronchopneumonia, pleurisy, thrombophlebitis, electrolyte imbalance, postoperative shock, retention of urine secondary to benign hypertrophy of the prostate, laryngeal edema, hematoma of the wound, subdiaphragmatic abscess, and complete obstruction at the site of anastomosis, with paralytic ileus In 2 cases leakage occurred from the duodenal stump, and in 1, from the anastomosis

WARREN A YEMM, M D

Improved Approach for Posterior Upper Thoracic Sympathectomy MacKay, H J J A M A 159 1261, 1955

A new and improved posterior approach to the sympathetic nerves of the upper part of the thorax, used for unilateral or bilateral upper thoracic sympathectomy, has the following advantages (1) a single midline incision and a laminectomy type of exposure, without muscle division, (2) minimal transverse process and rib resection, (3) direct access to the sympathetic chain medial to the pleural reflection, with excellent visibility by ordinary surgical lamps, (4) quick and secure closure of the wound, (5) a bloodless procedure without intrathoracic complications, (6) a decrease of at least 50 per cent in operating time, (7) a decrease of trauma to the patient, owing to conservation of time, tissue, blood and anesthesia and (8) a greatly diminished postoperative morbidity rate, which permits earlier ambulation and a shorter period of hospitalization than are usual

Although no distinct disadvantage is known, postganglionic cervicothoracic sympathectomy by the modified anterior approach is preferable This technic, which is described, has proved eminently satisfactory and gratifying in 14 cases of posterior upper thoracic sympathectomy (5 unilateral and 9 bilateral, 8 patients with heart disease, 4 with Raynaud's disease, 1 with causalgia, and 1 with Ménière's disease)

WILLIAM E N r

In Vitro and Clinical Effects of Urethane Plus Trietgylene Melamine on Human Breast. Black, M. M., and Speer, F. D., Surg., Gynec. & Obst. 102:420, 1956.

Although the *in vitro* and clinical demonstration of the possibility of enhanced benefits from combination chemotherapy for human cancer has opened an interesting avenue for further investigation, much more work is needed for a proper evaluation of its potentialities and its place in the treatment of cancer.

The authors have measured the *in vitro* dehydrogenase activity of cancer of the breast in 94 cases. Determinations were made of the effect of urethane and trietgylene melamine singly and in combination on such metabolic activity *in vitro*. The results indicate the existence of a synergistic action between urethane and trietgylene melamine in producing inhibition of metabolic activity.

The data obtained indicate therapy with the two substances is capable of producing striking clinical benefits in some cases of human mammary cancer.

EDMUND LISSACK, M.D.

Important Announcement For 1957!

The International Scientific Congress of the International College of Surgeons will be held at the invitation of the Mexican Government and under the Honorary Presidency of His Excellency, Don Adolfo Ruiz Cortinez, President of the Republic of Mexico, February 24-28 inclusive, 1957, at University City, Mexico, D. F. The Grand Opening Ceremony will take place at the Palace of Fine Arts, and the scientific sessions in the University buildings.

For further details address:
International College of Surgeons
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Attention: Secretary, Mexican Congress

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General Surgery

Tuberculosis of the Tongue

WILLIAM JAMES MOORE, C ST J, LRCSE, FR, FPS, MCPS (MAN), FRSM, (LONDON), FICS * AND JOHN FORREST HAMILTON, MD, K ST J **

GLASGOW SCOTLAND

TUBERCULOSIS, although a common condition in many parts of the body, is something of a rarity in the tongue Since 1804, when the first case was described, relatively few had been recorded [1] This communication suggests the ever-present possibility of the existence of such a lesion, its detection by transillumination, the technic of which has been fully described in previous papers,[2] and its investigation by inoculation of eggs and rodents, and its treatment by electrosurgical entervention

Anatomic Background—Only the relevant anatomic facts need mention Fibrous raphes divide the tongue longitudinally into equal halves, each of which, by the circumvallate papillae, is divided into an anterior two thirds and a posterior third The intrinsic muscles, by their peristaltic action, are largely responsible for dissemination, in which the lymphatic vessels also play their part

The apical lymphatic vessels pass into the submental glands of the same side and to the medial chain of deep cervical glands at the level of the cricoid cartilage of the larynx The marginal vessels drain the anterior two thirds of the lateral borders into the anterior submandibular glands; the posterior third into

*Formerly Surgeon Outpatients Department Victoria Infirmary Glasgow Assistant Surgeon Royal Samaritan Hospital Glasgow Surgeon Elder Hospital Govan Senior Assistant Professor of Surgery and Senior Assistant Professor of Anatomy Anderson College of Medicine

** Warden St John's Foundation Hospital Glasgow

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perior deep cervical glands, especially into one lying deep to the angle of the mandible, and, between these, a vessel drains into a gland situated over the bifurcation of the common carotid artery. The basal group of lymphatics drain the posterior third and terminate in the superior group of deep cervical glands, while the central group come from the center of the tongue and end in the deep cervical glands, which extend as far down as the cricoid cartilage.

Classification of Lingual Lesions. — Lesions of the tongue may be classified as (a) simple (dyspeptic or herpetic); (b) traumatic (resulting from dental injuries, coughing, or wounds); (c) malignant (carcinoma or sarcoma), and (d) specific (actinomycosis, syphilis, leprosy, poisons or tuberculosis).

Tuberculous lesions may be (1) nodular, either superficial or deep; (2) ulcerative, again superficial or deep or fissured, or (3) papillomatous.

Any of these conditions may be in the primary, secondary or tertiary stage.

Etiologic Factors.—Koch, in the eighties of the last century, demonstrated the causal bacillus. Tuberculosis in the human being, though more common in the young than in the elderly, may occur at any age, and the influence of heredity is marked. The disease is common in many animals, especially in the cow, while, as was noted by the late Sir William Macewen[3] it seldom occurs in the goat. It can be transmitted to man by (1) food (milk or meat from diseased cattle); (2) direct infection from cooking utensils, pipes, sputum or infected clothing; (3) inhalation of air contaminated by the breath of a patient or by dried sputum; (4) inoculation, and (5) trauma. Sir William Macewen clearly demonstrated that the site of a tuberculous lesion is often determined by trauma, the bacillus finding a favorable nidus in extravasated blood.

Hygienic methods of milking, the pasteurization of milk and the segregation of tuberculin-tested herds have made abdominal tuberculosis and tuberculous cervical lymphadenitis almost things of the past.

Diagnosis.—Tuberculous lesions of the tongue may be nodules, fissures or ulcers. The seat of election is the right side, usually at the juncture of the anterior two thirds and the posterior third.

All lingual lesions are accompanied by pain in the tongue, pharynx and ear, salivation due to the immobility of the tongue, and impairment of mastication, articulation and deglutition owing to the loss of movement in the organ. In some cases the sense of taste is lost, and in others there may be intermittent hemorrhage and foul breath. Glandular involvement occurs in the submental, the submaxillary and the upper group of the deep cervical glands. In cases of tuberculosis the glands present a conglomerate doughy mass, relatively fixed, indefinite in outline.

Palpation of the tongue should be followed by transillumination. The simple lesion shows a well-defined, semitranslucent, localized mass, the rest of the tongue being translucent. The tuberculous condition is recognized by the opacity of the base, its irregular contour and the absence of infiltration of the surrounding tissue. In some cases opaque streaks or small masses may indicate fissures or nodules. The general translucency of the tongue is diminished. Syphilis produces an almost opaque mass with well-marked rounded borders; in many cases scattered lesions are seen as dark streaks. The picture produced by epithelium is that of dark central opaque areas with irregular contours and ill-defined, markedly irregular borders. Prolongation of the mass into the surrounding tissues is characteristic.

Roentgenographic investigation of the chest and abdomen should be followed by

Fig. 1.—Photomicrographs illustrating the scarcity of giant cells and tubercle formation. *A*, ×26; *B*, ×83.

laboratory tests. The sputum should be examined for the tubercle bacillus, and the scrapings of the edges and base of the ulcer should be examined by smear and culture. Blood smears, blood count, and sedimentation rate and the Wassermann and Kahn reactions are also valuable.

Biologic methods include implantation into the anterior chamber of the eye of a rodent. We have noted that only malignant and embryonic tissues grow in this situation; unfortunately, a biopsy is necessary, and there is loss of time in obtaining results. Implantation may also be in the peritoneal cavity of a guinea pig. In view of the facility with which many viruses grow in the chorioallantoic space and the yolk sac of the fertilized egg, it was thought that it might be worth while to try this experiment with a tuberculous tumor; our experiments have been relatively few and, so far, without positive results.

The prognosis of primary tuberculous lesions of the tongue is relatively good, hopeful in the case of secondary but bad in that of tertiary conditions.

The four principal conditions are compared and contrasted in tabular form.

REPORT OF CASE

A business man aged 50 consulted us on Dec. 1, 1952. At various times he had been successfully operated on for stomach trouble, hernia and hemorrhoids. Thirteen years earlier he had been treated for syphilis, and several ulcerated "hacks" that had appeared on the tongue had not entirely responded to treatment. Shortly before we saw him an ulcer had appeared on the right border of the tongue, at the juncture of the anterior two-thirds and the posterior third, which had resisted local treatment.

The ulcer measured 1/4 inch (0.6 cm.) long by 3/4 inch (1.8 cm.) wide and extended to a depth of 1/25 inch (1 mm.). It was definitely demarcated from the surrounding tissue; the edges were slightly overhanging. The base was irregular, occupied by small nodules with shallow fissures, and was septic. The mass was fixed to the underlying musculature and was firm to palpation. The submental and submaxillary glands were enlarged, discrete, mobile and relatively soft.

Transillumination showed the characteristics of tuberculous ulcer, and there was no infiltration of the surrounding tissues. At first the ulcer was thought to be a primary condition.

The Wassermann and Kahn reactions were negative; the blood films showed moderate leukocytosis, the cells being of the small lymphocytic type, and films and cultures of scrapings of the ulcer gave negative results so far as the tubercle bacillus was concerned.

Roentgen examination of th s led

widespread tuberculous infiltration, of fairly long standing and mainly fibrotic. There was no evidence of cavitation, but there was considerable emphysema of the middle and basal zones. The likelihood now was that the condition was secondary rather than primary.

Treatment.—The patient was admitted to the Order of St. John Foundation Hospital, and the septic condition of the mouth was given suitable treatment. The mass was excised electrosurgically through an anteroposterior elliptic incision including a margin of healthy tissue. The wound was closed with deep catgut sutures, and the superficial fissure was coagulated.

Pathologic examination of the excised mass demonstrated that it was indeed a chronic tuberculous ulcer with caseation in the center.

Convalescence was uneventful, and the lingual condition healed quickly and gave no further trouble. Under treatment with streptomycin and para-amino sulphate the lungs steadily improved, as was shown by the results of roentgen examinations on various dates. Unfortunately, eighteen months after the operation, pneumonia developed in this patient, and, since he was alcoholic, it is perhaps not surprising that he did not recover.

In the treatment of ulcers and fissures of the tongue the electrosurgical technic is the method of choice, and it is even more so if the lesion is malignant. By its use parenchymatous hemorrhage is instantly controlled, nerve endings are completely insulated, lymphatic spaces are sealed (which prevents dissemination), and the final result is a soft, flexible mobile scar. Full details of the technic have been presented.

Postoperatively, great comfort is obtained by drying the tongue with a silk handkerchief and massaging it with Butlin's ointment (composed of iodoform, 1 gr., morphine sulphate, 1/6 gr., and borax, 3 gr., in each ounce).

The ointment may be used several times daily but especially before meals and before retiring for the night.

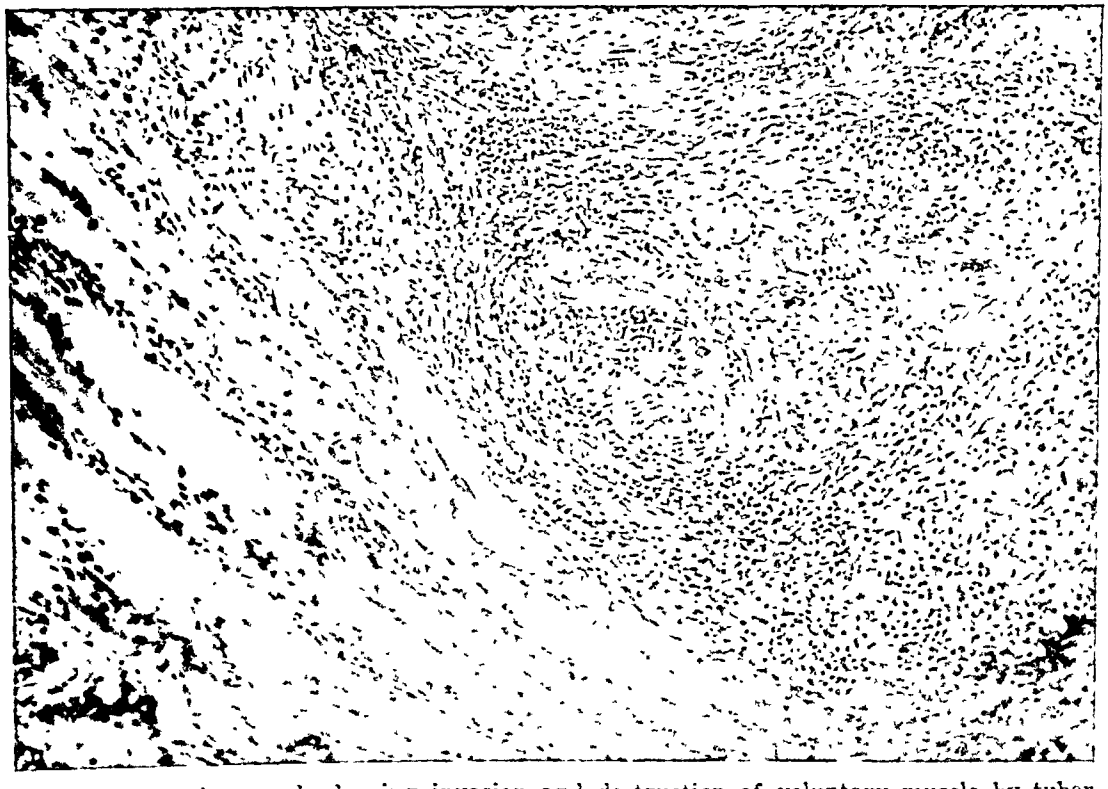

Fig. 2.—Photomicrograph showing invasion and destruction of voluntary muscle by tuberculosis.

Pathologic Picture. — It has been held that tuberculous nodules in the substance of the tongue are primary conditions resulting from blood-borne infection. Ulcers are frequently secondary; it is obvious that infected sputum, constantly passing over the tongue, may infect some small fissure, perhaps not previously detected. It is also possible that infection may take place by way of a papilla. It is possible that infection may, by the peristaltic action of the muscles, be carried to deeper parts and create tuberculous nodules. In view of this possibility it might be wise to regard a nodule as primary only when no other tuberculous lesions can be detected, especially in the lungs. It would seem that the most probable source of primary infection is contaminated meat or milk, which, in these days, are rarely encountered.

The pathologic features differ from those of tuberculous lesions in other parts of the body in that there is not the same tendency to tubercle formation, nor does the production of giant-celled systems take place.

Three main types are recognizable: (1) the nodular variety; (2) the papillomatous variety (very rare), and (3) the ulcerative variety, which may be superficial or deep, and of which the fissured type is the most common.

The ulcer is usually elongated or ovoid; it may be single or multiple, and usually its long axis lies in the long axis of the tongue. The edges are well defined and perhaps slightly elevated but not definitely undermined or raised. There may be small tubercles around its edge, and the base is usually irregular and covered by a yellowish-gray mucous layer. The papillomatous type is rarely an exaggerated fissure, the epithelium being corrugated and infiltrated by small tubercles. The tubercles are composed of a few giant cells, poorly developed, that contain few nuclei.

Experimental Data. — Intraperitoneal injections of 3 cc. of sputum were made in 2 guinea pigs. In 1 the result was negative after four weeks, but the other gave a positive reaction after six weeks. Injection of sputum into the anterior chamber of a rodent's eye gave an entirely negative result after three months. Greene[4] has stated that only embryonic or malignant tissues will grow in the anterior chamber of the eye.

After using the fertilized egg in the investigation of malignant disease, we resolved to use it in an attempt to culture the tubercle bacillus. Sputum was treated with antiformin and centrifuged for thirty minutes, and the residue was injected into 9 fertilized eggs that had been incubated for four days.

Groups of 3 were treated by injecting 0.25 cc. respectively into the yolk sac, the chorioallantoic membrane and the chorioallantoic space.

Transillumination after four days showed 1 embryo dead in the first group and 1 in the second. Four days later all were dead except 2 in the third group; these were also dead at the end of a further four days. All the membranes were examined, but no tubercle bacillus was observed. Injection of the egg fluid intraperitoneally into 2 guinea pigs gave a negative result after six weeks. It is possible that further work may demonstrate that the fertilized egg may be used as a diagnostic aid. The fertilized egg was first employed by Ogston,[5] who, by its use, isolated the streptococcus.

CONCLUSIONS

A case of tuberculosis of the tongue, a rare but definite clinical entity, is reported. The authors point out the importance of the peristaltic action of the lingual musculature in dissemination of the organisms and cells.

The seat of election of [illegible]

Diagnostic Table

Factor	*Simple Ulcer*	*Syphilitic Ulcer*	*Tubercular Ulcer*	*Malignant Ulcer*	*Comments*
Incidence	Common	Not so frequently as formerly	Rare	Has become less frequent	Syphilis should always be considered
Onset	Sudden	Usual 4-12 weeks following primary lesions	May be primary but usually in late pulmonary cases	Insidious	
Age	Any time from infancy to old age	Any age, but usually from 20 onward	In early adult life	Peak period from 40 to 65 years	
Sex	Either	Male predominates	Either	Males	Malignant ulcer said to be very rare in females
Race	No special predilection	Colored races most frequent	Probably equal	Frequent in certain colored races	
Social State	Frequent in lower social status	In lower social scales	No marked difference	In the artisan class	In clay pipe smokers and those who chew tobacco
History	Appears following slight discomfort	In the wake of venereal infection	In cases of pulmonary tuberculosis	Often follows long standing irritation	
Progress	Resolves rapidly to local treatment	Disappears with constitutional treatment	Temporary cure by surgical treatment	Does not resolve to treatment	
Situation	Any part	Mainly on the dorsum	Borders frequently (right seat of election)	The left border seat of election	Decayed teeth of syphilis
Consistency	Uniformly soft: localized	Firm; relatively fixed	Like putty	Granite like; fixed	
Mobility	Mobility (complete)	Relatively fixed	Loose fixation	Fixation complete	
Glands	May or may not be enlarged	Hard like lead shot, freely mobile	Enlarged like dough; relatively fixed	Hard fixed; irregular immobile mass	
Ulcer: Edge	Well defined; regular	Well defined, punched out appearance	Thick, overhanging, irregular, nodular	Irregular hard sinuous and everted	
Base	Smooth; regular	Covered by slough like wash leather	Irregular nodular septic	Rough irregular nodular septic	
Contour	Regular; well defined	Relatively regular; definition fair	Tends to be irregular definition poor	Irregular, ill defined	

Films	Usually leukocytes	Spirochaetae pallida	Tubercle bacillus	Malignant cells	Papanicolaou's method found helpful
Breath	Normal	Depends on presence of sepsis	Usually unpleasant	Foul	
Clinical	Prompt reaction to local treatment	Responds to constitutional remedies	Unsatisfactory improvement temporary	Does not respond to treatment	Tend to recur after removal
Hematology	Leukocytosis, Wassermann and Kahn reactions negative	Wassermann and Kahn reactions positive	Wassermann and Kahn reactions negative, lymphocytosis	Wassermann and Kahn reactions negative	
Urine	Normal	Normal	May contain tubercle bacilli	Ellasner and Wallis Robertson test	Syphilis and neoplasia may co exist
Transillumination	Faint shadow	Shadows definite and multiple	Opacity marked, defined shadow	Densely opaque in regular, tissues dense	
Biopsy	Inflammatory tissue	Epithelioid cells and spirochaetae pallidae	Tubercle bacilli, giant cells	Cell nests invasion of tissues	
Biological	Transplantation to anterior chamber of eye (negative)	Transplantation (negative)	Transplantation—negative	Transplantation—possible	Greene states only malignant tissue will grow in anterior chamber of eye
Treatment	Local remedies produce cure	Constitutional produces a cure	Indefinite	Complete surgical excision	
Result	Permanent cure	Cure but treatment may have to be repeated	Usually unsatisfactory	Unsatisfactory	
Termination	No recurrence	Should be kept under observation	Possibly temporary cure	Life prolonged—average 3 years	
Radiology	No lesion found in any other part of body	Gummatous lesions may be present	Pulmonary or intestinal lesion primary	Secondary deposits may be found anywhere	

ulcer of the tongue is the right border, at the juncture of the anterior two-thirds and the posterior third, while that of malignant tumors appears to be the same position on the left side.

Attention does not appear to have been previously directed to transillumination of the tongue, which the authors regard as valuable to diagnosis.

The benefits of the electrosurgical technic have once more been demonstrated. Excision in the long axis of the tongue produces practically no interference with function. Hemorrhage is controlled and dissemination prevented. The resulting scar is painless and clinically good. The coagulation of associated ulcers results in prompt healing. Postoperative treatment with Butlin's ointment is advised.

Mention is made of experimental work on guinea pigs and with the fertilized egg. The experimental work was conducted by the senior author.

Author's Note: With pleasure we record our thanks to Prof. J. W. Emslie, who placed the resources of his laboratory at our disposal, and to Mr. R. Campbell for his technical help in the experimental work.

RESUMEN

Se comunica un caso de tuberculosis lingual, entidad clínica rara pero definida. Los autores señalan la importancia de los movimientos linguales en la diseminación de los gérmenes.

El sitio de elección de la lesión es en el borde derecho, en la unión del tercio posterior con los dos tercios anteriores. A diferencia, los tumores malignos ocurren en el borde izquierdo.

Aparentemente, anteriormente no se ha prestado atención a la transiluminación lingual. Los autores la consideran de valor en el diagnóstico.

Una vez más se demuestran los beneficios obtenidos por la técnica electroquirúrgica. La extirpación a lo largo de la lengua no interfiere practicamente la función. Se controla la hemorragia y se evita la diseminación. La cicatriz es indolora y buena desde el punto de vista clínico. La coagulación de úlceras concomitantes produce cicatrización acelerada. Se recomienda el tratamiento postoperatorio con unguento de Butlin.

Se menciona un trabajo experimental con cuyes y huevos fertilizados. Dicho trabajo ha sido realizado por el primer autor.

CONCLUSIONS

Un cas de tuberculose de la langue, entité clinique rare mais bien déterminée, est rapporté. Les auteurs signalent l'importance de l'action péristaltique de la musculature linguale dans la dissémination de germes et de cellules.

Le lieu d'élection de l'ulcère tuberculeux de la langue est le bord droit, à la jonction des deux tiers antérieurs et du tiers postérieur, alors que celui des tumeurs malignes semble être situé au même niveau du côté gauche.

Aucun intérêt ne paraît avoid été accordé jusqu'ici à la diaphanoscopie de la langue, que les auteurs considèrent comme un auxiliaire précieux du diagnostic.

Les avantages de la technique électrochirurgicale sont une fois de plus démontrés. Une excision le long de l'axe longitudinal de la langue ne provoque pratiquement aucun trouble fonctionnel. L'hémorragie est contrôlée et la dissémination évitée. La cicatrice est indolore. La coagulation d'ulcères secondaires entraîne une cicatrisation rapide. Un traitement post-opératoire au moyen de la pommade de Butlin est conseillé.

Les auteurs citent le travail expérimental de l'un d'eux sur des cobayes et avec l'oeuf fécondé.

CONCLUSIONI

Viene riferito un caso di tubercolosi della lingua, che è un'affezionerara ma ben

definita L'autore mette in risalto l'importanza dei movimenti peristaltici della muscolatura linguale nella disseminazione dei germi La sede di elezione delle ulcere tubercolari della lingua e il bordo destro di essa, alla'unione fra il terzo medio e il terzo posteriore, mentre la sede preferita dai tumori maligni e la stessa, ma dal lato sinistro

Fino ad ora non si e data importanza alla transilluminazione della lingua come mezzo di indagine, ma l'autore ritiene che questa manovra possa avere importanza per la diagnosi

Una volta ancora si dimostrano i benefici dell'elettrocoagulazione, l'escissione lungo l'asse maggiore della lingua praticamente no danneggia la funzione di essa L'emorragia puo essere controllata e non si ha disseminazione

La cicatrice che ne risulta e soddisfacente e non dolorsa La coagulazione delle ulcere è seguita da una pronta guarigione Viene suggerito un trattamento postoperatorio con unguento di Butlin

CONCLUSOES

Os autores apresentam um caso de tuberculose da lingua, uma entidade rara mas definidamente clinica Salientam a importância da ação peristaltica da musculatura lingual na disseminação de organismos e celulas

O local da ulcera tuberculosa da lingua e na borda direita, na junção dos dos terços anteriores com o terço posterior, en quanto o dos tumores malignos parece ter a mesma posição no lado esquerdo

Parece que não se deu atenção previa a transilluminação da lingua, que os autores encaram como auxiliar valioso de diagnóstico

Os beneficios da tecnica eletrocirurgica foram mais uma vez demonstrados A excisão do longe eixo da lingua praticamente não interfere com a função A hemorragia é controlada e a disseminação prevenida A cicatriz resultante e indolor e clinicamente bôa A coagulação do ulceras associadas resulta na cicatrização imediata Aconselham o tratamento pos operatorio com formula de Butlin

Mencionam um trabalho experimental em cobaias e com ôvo fertilizado O trabalho experimental foi orientado pelo autor mais velho

SCHLUSSFOLGERUNGEN

Es wird uber einen Fall von Tuberkulose der Zunge, einem seltenen aber ausgesprochenen Krankheitszustand berichtet Die Verfasser weisen auf die Wichtigkeit per peristaltischen Aktion der Zungen muskulatur hin, die bei der Aussaat von Krankheitserregern und von Zellen eine Rolle spielt

Der Lieblingssitz des tuberkulosen Geschwurs befindet sich an der Verbindungsstelle des hinteren Drittels mit den vorderen zwei Dritteln des rechten Zungenrandes, wahrend die bosartigen Geschwulste besonders gern an derselben Stelle des linken Zungenrandes auftreten

Die Verfasser halten die Transillumination der Zunge, der man fruher offenbar keine grosse Aufmerksamkeit geschenkt hat, fur ein wertvolles diagnostisches Hilfsmittel

Auf die Vorzuge der elektrochirurgischen Technik wird wieder einmal hingewiesen Die Resektion in der Langsachse der Zunge fuhrt praktisch zu keiner Storung der Funktion Die Blutung wird zum Stillstand gebracht, und der Aussaat des Krankheitsherdes wird vorgebeugt Es entsteht eine klinisch gute und schmerzlose Narbe Die Koagulation begleitender Geschwure fuhrt zu unverzuglicher Heilung Zur Nachbehandlung wird die Verwendung der Butlinschen Salbe empfohlen

Die vom Seniorverfasser ausgefuhrten experimentellen [illegible] Meerschweinchen und am [illegible] den erwahnt.

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Antisepsis has changed the entire appearance of the doctor's office and his operating-room. He boils his knife before using it and disinfects the skin before cutting. The dentist also boils his instruments and is as careful in his technique as his surgical confrere. But perhaps nowhere have the styles changed more than in the surgical amphitheatre. A generation ago the surgeon walked into the surgical amphitheatre, donned an old black frock-coat with satin lapels, adjusted his glasses, flicked some dust off his sleeve, and set to work. He had not washed his hands, he wore no gloves, the frayed coat-cuffs got into his operating-wound, and the old frock-coat was stiff with dried blood of previous operations. Contrast such a scene with the modern operating-room — its seething sterilizers, its patient covered with sterile sheets, its surgeons and nurses in sterilized gowns, wearing sterilized gloves and sterilized masks! Such is the difference that bacteriology has made.

A short time ago a learned Anglican bishop suggested that since the discoveries of science were crowding upon us so fast, we were unable to digest them; we should declare a holiday in science until we have assimilated what we have learned. Not an unsound suggestion. An art-collector should have some leisure to enjoy the treasures he has accumulated and the scientist should have time to think over what he has learned. But there is not the slightest chance that the bacteriologist will take any scientific holiday. There is still too much to be learned and too many diseases produced by bacteria as yet untamed.

—*Major*

Hernias: Observations on Recurrence and Repair

LAWRENCE W LONG, M D F A C S F I C S
JACKSON MISSISSIPPI

THIS article is a brief review of hernias of all types, with emphasis on the most frequent type, inguinal (direct and indirect), a discussion of the reason for recurrence and a brief presentation of methods of repair of the two types of hernias which seem to be on the increase —diaphragmatic and ventral (postoperative)

Many papers have been published on the history, anatomic aspects, etiologic factors and methods of repair of the different types of hernia I shall list the various types and their percentage as they relate to each other The incidence of inguinal hernia in young men, aged 19 to 45 years, in 250,000 examined over six years, was 6 per cent This remains fairly stable through the years, while the recognition of diaphragmatic hernias has increased from 19 observed at necropsy in 1900 to many thousands *in vivo* now I should like to call attention to the increase in postoperative ventral hernias as more abdominal operations are performed

Inguinal Hernia —In discussing direct and indirect inguinal hernias, one should pause to pay respect to the many great surgeons who have added much to the development of present day methods of repair The diagnosis has never been a problem The treatment has been varied, as the literature indicates Presumably accurate figures in reports of examinations reveal that about 4 per cent of the population of the United States or 6,000,000 persons, have inguinal hernia Naturally, as the national population increases, the number of inguinal hernias increases also

Surgeons have made a great deal of progress in their approach to inguinal hernia and its treatment Although the Bassini operation has been a good basic procedure for repair, a better method, in my opinion, is now available No doubt more careful examination at the time of operation and more thoughtful study of the anatomic nature of the region have altered the surgeon's point of view with regard to this problem Frequently a direct and an indirect inguinal hernia are observed together in the same canal Usually the indirect hernia is large and the direct hernia small or even represented only by a weakness in the transversalis fascia in the floor of the inguinal canal that will herniate when pressure is exerted on it later as a result of closing the indirect hernia I have observed many a patient with a supposedly recurrent indirect inguinal hernia that was not actually recurrent but a new direct inguinal hernia This does not happen in the majority of instances of recurrence, as I once thought it did, but apparently it does occur in about 47 per cent of recurrences

I am convinced that inguinal hernias should be repaired when they are discovered, generally speaking, and that the development of anesthesiology has influenced all surgeons in this attitude Infants and children should have the repair done when the diagnosis is made, regardless of age provided their general condition does not contraindicate an elective operation I do not recommend the use of a truss, either for the young or for the very old, because of the false security it affords and

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Hernias

Type		Sex	Incidence, Rate, %	Congenital, %	Acquired, %	Traumatic, %	Trend
Inguinal		M	80	9	90	1	±
Femoral		F	10	2	98		±
Umbilical		F	4	50	50		±
Diaphragmatic		M	2	16	34	50	+
Ventral		F	1	1	98	1	+
Lumbar	Pelvic	M			99	1	±
Obturator	Pelvic	F			100		±
Perineal	Pelvic	F			100		±
Sciatic	Pelvic	F			100		±
Internal	Pelvic				100		±

the trauma it produces in the soft tissues when it is tight enough to be of any value.

It seems, therefore, that the current approach to the problem is more sensible than that which prevailed fifty years ago. I repeat that the time to repair such a condition is when it is detected, unless there be some immediate contraindication, and that one must so approach the problem as to close the defect and then reinforce it, so that it will not recur. In my opinion this is applicable to all ages and both sexes.

The operation for repair of an inguinal hernia is one of the most common operations performed in both large and small hospitals in the United States. In teaching hospitals it is one of the first major operations to be turned over to young surgeons. Strangely enough, the procedure is still far from standardized. There are innumerable variations, many of which bear the names of distinguished surgeons. Each variation has been prompted by dissatisfaction with the results previously obtained. The results following the use of a new technic are always an improvement over previous results. Considering the great number of technics that have been described, one cannot help wondering whether the better results are due to the new technic or to the fact that the author has made himself, and those exposed to his teaching, a better surgeon. Stimulating interest and studying one particular subject will always improve performance and equip one to perform the task better and in a more precise and detailed manner.

The success of any technic is partly measured by the recurrence rate for inguinal hernia. On this basis, a surgeon should consider a change for the better regardless of the technic he is now using. I emphasize the importance of accurate closure of the internal ring, firm closure, at the pubic symphysis, of the posterior inguinal canal and reinforcement of the transversalis fascia. I am convinced that sutures of foreign material will not hold muscle to fascia any longer than it takes for the suture to cut through the muscle. I have refrained from using wire mesh or any other reinforcing substance of foreign material in this series of cases, though I have used wire mesh and wire sutures for the incisional type of hernia.

I am convinced also that my method of repair prevents recurrence, in addition to curing the immediate defect. Inguinal hernia occurs in persons of all ages and races and of both sexes, but it is more frequent in the male than in the female. No doubt the explanation of the descent of the testicle is a satisfactory reason for this predominance. I recognize the fact that volumes are on record concerning the history, the causation, the incidence and the many methods of repair of this type of hernia, but in my opinion my composite method, which incorporates the best features of some famous surgeons' technics, offers the best possible chance of permanent repair of either a direct or an indirect inguinal hernia. The method is based on two cardinal principles: (1) closure of the present defect and (2) reinforcement of the closed defect to prevent recurrence.

The anatomic character of the region should be taken into consideration. The

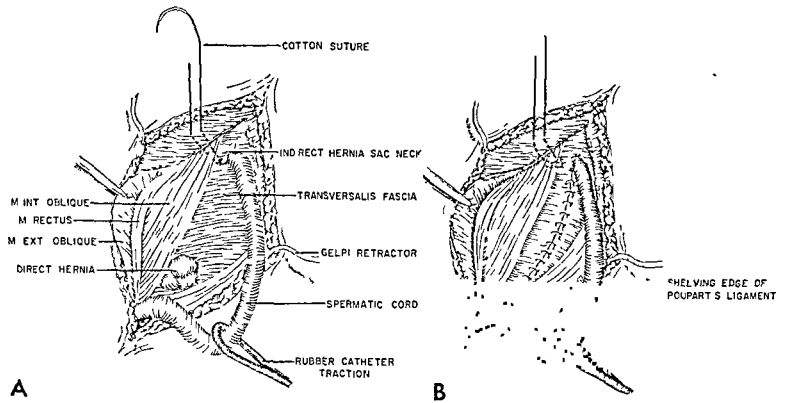

Fig. 1.—*A*, high ligation of sac. *B*, plication of transversalis.

posterior wall of the inguinal canal is floored by transversalis fascia only, in its weakest point, bound by the falx, lacunare ligament (Gimbernat's), Cooper's ligament, Hesselbach's ligament and the rectus muscle. The internal ring, of course, is the natural opening through the abdominal wall. It is desirable, therefore, to close the internal ring around the cord and ligate the hernial sac high if the hernia is indirect or is direct and associated with a sac, and to transplant the neck of the sac beneath the internal oblique muscle, sewing the ligature of cotton through the external oblique fascia in closing the same (Fig. 1). The sheath of the rectus muscle is incised longitudinally to allow both the internal oblique and the transversalis muscle to move more easily toward Poupart's ligament, particularly in an elderly patient. (I do not generally use that part of the technic for children.) Next, I use cotton also here and plicate the transversalis fascia into Cooper's ligament, taking up all slack and reinforcing the weak spot in this manner. A living fascia suture (Fig. 2) obtained from the cut edge of the external oblique muscle and left attached to the external ring but sutured with cotton at its point of attachment, is used with a Gallic needle to fasten down the internal oblique muscle to the shelving edge of Poupart's ligament. This reinforces the transversalis fascia. The external oblique muscle is then closed with catgut and the skin with dermal sutures.

The types of recurrence are well illustrated by the study done at Ann Arbor, Michigan by Zawacke and Thieme (Fig. 3), which includes (a) sharply localized recurrence at the internal ring, (b) recurrence above and lateral to the internal ring, (c) indirect hernia, (d) localized defect at the pubis and (e) direct hernia. The average age of the 105 patients with recurrence in this series was 53 years, and the average time of recurrence was three and six-tenths years after repair, with the following percentages, respectively, in the five groups: (a) 19 per cent; (b) 13 per cent; (c) 21 per cent; (d) 23 per cent, and (e) 24 per cent, while that of indirect hernia was 53 per cent. These cases were well followed an e authors,

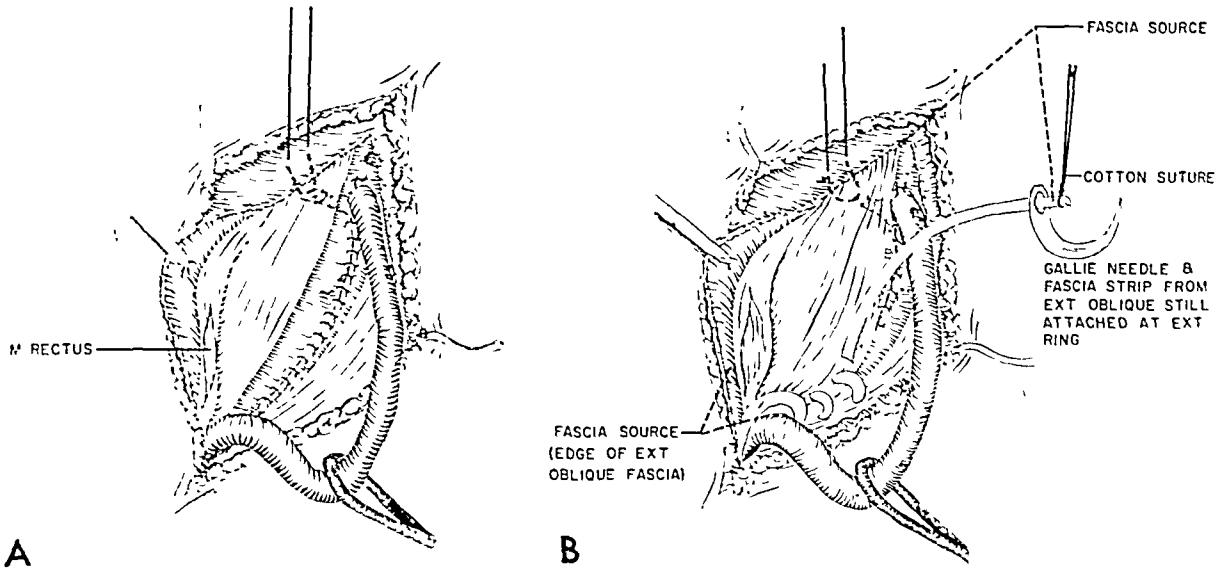

Fig. 2.—*A*, anterior rectus sheath incised. *B*, internal oblique sutured to Poupart's ligament with fascia.

and they have convinced me that hernias repaired in young persons do not recur as often as do those repaired in older persons. All patients with hernias in early life, *therefore, should seek repair as early as* possible.

In conclusion, my composite method of repair does a better job of repair and prevention of recurrence than any other I have witnessed, because it provides the following advantages:

1. High ligation and transfixation of the neck of the sac (for indirect inguinal hernia).

2. Tight closure of the internal ring around the cord and neck of the sac.

3. Plication of the transversalis fascia. This remedies the defect of a direct inguinal hernia, which occurs between the internal ring and the pubis and occurs in 47 per cent of the cases of recurrence after repair of an indirect inguinal hernia if the procedure is not carried out.

4. Longitudinal incision of the posterior rectus sheath beneath the external oblique fascia. This permits the internal oblique and transversalis muscles to slide over easily to Poupart's ligament and aids in the additional fortification of the posterior wall of the canal when it is plicated with cotton.

5. The use of a strip of fascia from the external oblique muscle. This eliminates *the necessity of obtaining fascia by an*other incision. It will live and grow in its own habitat, reinforcing the fascial wall at the point where it was weakest. It seems to me that permanent fixation of muscle to fascia by any other type of suture than fascia itself is questionable. I have had no need of mesh, wire or any other foreign material in treating this type of hernia since I began using fascial sutures obtained from the external oblique muscle.

Ventral Hernia.—A ventral hernia involves the anterior abdominal wall, but not the portion involving the inguinal femoral or the umbilical opening. Ventral hernias have been classified into three varieties:

1. *Median Ventral Hernia:* This is sometimes classed as epigastric hernia, which occurs in the midline. Subserous fatty protrusions, painful and irreducible, and located especially along the linea alba in vigorous, well-developed men, may be observed. Sometimes a true hernia is associated with this condition. Its treatment

is incision, removal of the fat and/or sac and closure of the opening in the linea alba with imbrication

Diastasis of the rectus muscles occurs from the xiphoid to the pubis, but mainly above the umbilicus It is usually obse in multiparous women with relaxed cles The linea alba bulges forwar tween the recti This can be easily c by the imbrication or interdigitatic

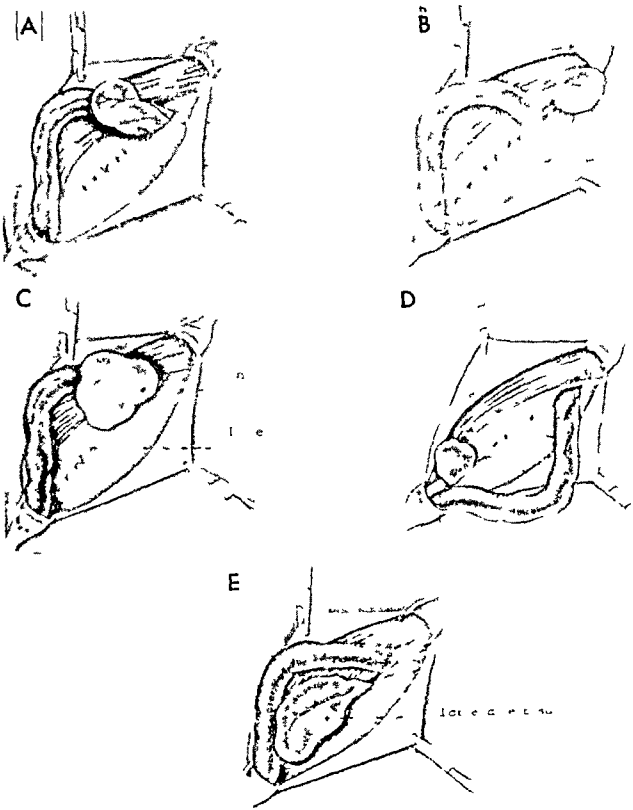

Fig 3—Types of recurrence In 105 cases of recurrent inguinal hernia the average age of the tients being 53 The percentage incidence of each type and the interval between operation and currence respectively are as follows *A*, 19 per cent, interval one and five tenths years, *B*, 13 cent, interval one and six tenths years, *C* 21 per cent interval three and three tenths years; *D*, per cent, interval one and one half years, *E*, 24 per cent, interval six and six tenths years *(Zaun and Thieme)*

the stretched linea alba, which pulls together the separated rectus muscle. On one occasion I found it necessary to use wire mesh to fortify this area. A similar condition occurs in young children, in which this protrusion occurs between the rectus muscles. In my experience this has always been transient, disappearing as the child develops.

2. *Lateral Ventral Hernia:* This is a very rare condition, which is mentioned only for completeness. It occurs at the juncture of a line between the umbilicus and the anterior superior spine in the linea *semilunaris where the inferior epigastric* artery pierces the abdominal wall.

3. *Postoperative or Incisional Hernia:* This type of hernia is usually due to: (a) division of the intercostal nerves, followed by paralysis and wasting of the muscles, chiefly the rectus; (b) faulty suturing (unsuitable material or sutures tied too tightly); (c) infected wounds, with sloughing and weakening of the abdominal wall; (d) drainage wounds, and (e) imperfect or impossible closure due to removal of a portion of the abdominal wall.

Frequently these incisional hernias are loculated and the abdominal contents adhere to the sac adhesions; angulation of the bowel and omental adhesions therein are common. One should try to prevent this type of hernia by using anatomic incisions, muscle splitting and avoidance of the intercostal nerves, especially at the lateral edge of the rectus or further laterally. Snug, but not too tight, sutures should be the rule also. When drainage is instituted, careful closure and interruption of the sutures around the drain are very important.

If the hernia is relatively small, the structures of the abdominal wall can be easily dissected out, identified and closed in layers after the peritoneum is closed. But when the hernia is large with a large opening, one frequently notes that, owing to retraction and loss of tissue, the opening is too large to bring together without tension. In these circumstances it must be covered or patched with some material to close the hernia opening. I formerly used fascia lata reinforced with strips of the same, but now I use metal mesh, either tantalum or stainless steel, always preferably over the peritoneum and covered with two layers' overlapping of the fascia and/or the sac. Often there is insufficient fascia not retracted or sloughed out, in which case it is advisable to cover the mesh with either fascia or attached hernia sac and not leave it covered only with subcutaneous fat. Also, I consider it advisable to use either steel wire suture or catgut suture to fasten the mesh to the abdominal wall. In my experience, cotton, silk and linen have all produced foreign body reactions with prolonged drainage. A rubber tissue drain should always be used to allow removal of the excessive serum from around the mesh. I have never used gelfoam or any other such agent. The mesh should always be free-lying, not cramped in its bed and not under tension, but snug. I have reduced considerably though not entirely eliminated, recurrences after repair of the incisional hernias treated by myself.

Diaphragmatic Hernia.—This interesting lesion has acquired primary importance in the past fifty years, and emphasis has been placed on it especially in the past twenty-five years, with the development of advances in thoracic surgery, new roentgen technics and machines and the development of modern anesthesia, each of which seemed to start a new epoch in surgery.

It should be remembered that the action of the diaphragm affects four major functions: respiration, circulation, parturition and digestion. It occupies the highest place among the skeletal muscles and approaches the heart in its behavior and the

importance of its work. The right and left phrenic nerve exactly divides the diaphragm into two parts and is the only motor nerve thereto. It is a pressor organ, bringing about variations in abdominal pressure; it is a partition between the thorax and the abdominal cavity, preventing interference with the action of the heart and lungs; it is a respiratory muscle of contraction that permits inspiration and acts as venous pump, but is not indispensable. At its hiatus esophagi it completely surrounds the opening with muscle and acts as a pinchcock to prevent regurgitation from the stomach into the esophagus. It is both a voluntary and an involuntary skeletal muscle.

There are three types of protrusion of the abdominal contents through the diaphragm: (1) congenital (true or false congenital hernia); (2) acquired (true or false acquired hernia), and traumatic (true or false traumatic hernia). The words "true" and "false" are here used to indicate the presence of a sac (true hernia) or its absence (false hernia).

A congenital hernia is present at birth. About 20 per cent of all diaphragmatic hernias reported are congenital.

An acquired hernia is one that develops gradually after birth in a weak area, in the esophageal hiatus, in the parasternal region or in the lumbocostal trigone. In my opinion its development is exactly like that of the inguinal hernia.

A traumatic hernia is one that develops as a result of a penetrating injury or of rupture due to compression of the chest or the abdomen. I see no reason to attempt to distinguish between a recent traumatic rupture of the diaphragm, with prolapse of the abdominal contents, and a rupture of long standing, with a false sac of omentum or peritoneum or a true sac, since the treatment in each instance is the same.

I shall omit eventration of the diaphragm, which is produced by interruption of the phrenic nerve or congenital atrophy of the same, since this is a distinct clinical entity.

Incidence: About 95 per cent of traumatic hernias occur on the left side. Half of those which do occur on the right side are central, but half of those on the left side are lateral in origin. Eighty per cent of nontraumatic hernias occur on the left side, of which 20 per cent are at the esophageal hiatus, 20 per cent are posterior and 15 per cent are central.

A few bilateral hernias have been observed at the parasternal opening, as well as a few so-called bilateral esophageal hernias, which means a bilateral distribution of the sac through a common opening.

Although only 19 cases of hiatus hernia had been reported up to 1900 and all were observed at necropsy, the lesion has now been shown to be more common. This is a result of roentgen examination with the patient in the Trendelenburg position, which prevents the reduction of the herniated viscus by gravity that hindered the examination of a patient under the fluoroscope.

The hernial contents may be (a) a single viscus, (b) all abdominal organs except those in the pelvis or (c) a combination of the two. A typical hiatus hernia contains only the cardiac portion of the stomach; a parasternal hernia, a loop of the transverse colon, and a right-sided hernia, some portion of the liver.

Etiologic Factors: Sex seems to play no part in the distribution of congenital hernia. Hiatus hernia occurs most frequently in the female; 90 per cent of traumatic hernias occur in the male. As to age, one-third of the patients with acquired hernia are more than 40 years of age when the lesion is discovered. The majority of persons with traumatic hernia are between 20 and 50 years of age.

Since other congenital defects, e.g.,

harelip, cleft palate, and various anomalies and monstrosities, are frequently associated with congenital diaphragmatic hernia, I have concluded that the direct cause of this lesion is faulty development of the diaphragm, the specific cause being maldevelopment in general.

Acquired hernias are probably caused by increased abdominal pressure due to straining at stool, micturition, coughing, vomiting or labor. This offers an adequate explanation of hiatus hernia in women, associated with weakening of the diaphragmatic muscle and absorption of fatty deposits between the serous membranes.

Traumatic hernia results about equally from penetrating and non-penetrating injuries.

Symptoms: There is no characteristic symptom or syndrome; widely varying symptoms may be produced by any type of diaphragmatic hernia. Acute obstruction may be the first symptom. The presence of severe anemia may lead one, in the course of examination, to discover its cause in a hiatus hernia, with bleeding from the cardiac end of the stomach.

Symptoms may be grouped into those referable to the thorax and those referable to the abdomen. Dyspnea, dysphagia, cyanosis, palpitation, fullness, pain under the shoulder or sternum, coughing and (occasionally) hiccough are the usual thoracic symptoms. Many of these symptoms are brought on if the patient lies down after a full meal or after drinking a quantity of fluid. Splashing or gurgling, with a feeling of fullness in the chest, has been noted. A feeling of suffocation has also been observed. The abdominal symptoms are not characteristic but are those of indigestion, suggestive of cholecystic disease or peptic ulcer. Nausea and vomiting are frequent; hemoptysis and melena are less common.

A hiatus hernia produces mild symptoms of indigestion, with some dysphagia and inability to lie down after a full meal, while parasternal hernias produce constipation, colicky pains and, finally, obstruction.

Acute traumatic hernias are characterized by shock, hemorrhage, dysphagia and pneumothorax, with a possible mediastinal shift and retraction of the abdomen.

Physical Signs: These, when present, are chiefly thoracic. The most common are decreased excursion of the thorax on the affected side, enlarged hemithorax, and decreased excursion with increased tympany and liquid sounds on auscultation, with or without retraction of the abdomen and dextrocardia, but the diagnosis is usually made or confirmed by means of the roentgen ray.

Diagnosis: By the year 1912 approximately 900 cases of diaphragmatic hernia had been reported in the literature, in 17 of which the condition was recognized clinically. With wider use of the roentgen ray, however, especially in the routine examination of patients, there are hundreds of cases in which the hernia is recognized without symptoms. When the diagnosis has been sifted down to the roentgenogram, there are usually only two conditions which must be differentiated, namely, esophageal diverticulitis and eventration of the diaphragm, and this differentiation is within the province of the roentgenologist. When the hernia has been demonstrated by roentgen ray it is definitely there; it can be present but not demonstrable, however, a solid viscus instead of a hollow one being observed above the diaphragm. The differential diagnosis involves the diseases that affect the stomach, the terminal portion of the esophagus, the gallbladder and lungs (e.g., pleuritis).

Treatment: The treatment is surgical repair with nonabsorbable sutures, with or without the use of fascia lata. The morbidity and mortality rates, in trained

hands, now justify abandonment of the false conservatism of the past.

It has been my experience and observation that infants with large hernial defects die early, with or without repair. Others advocate operation in the first forty-eight hours. Smaller defects can be more safely repaired after several months of age. Openings too large for primary repair may be closed by the aid of the patient's own fascia lata in a doubled sheet large enough to overlap the opening without tension after the phrenic nerve has been crushed on the affected side.

Hiatus hernia may be relatively inaccessible from the abdominal side in the asthenic patient with a high diaphragm and low rib cage or the short fat patient with a short anterior-posterior diameter of the thoracic cage. Hernias in such patients are easily repaired by the thoracic approach, which I favor more and more as times goes on, even using the combined abdominothoracic approach when necessary—although I encounter more complications with this approach than with either of the others.

The parasternal hernia is easily repaired through an epigastric approach.

Immediate repair of a traumatic hernia should be done after relief of shock, hemorrhage and anoxia. One should always weigh the severity of the symptoms against the condition of the patient, individualizing every case.

The abdominal surgeon always desires to see the organs of obstruction, those which are ulcerated and those adherent to the sac, while the surgeon who frequently explores the chest realizes the advantages of exposure and separation of adhesions to the thoracic viscera. A traumatic hernia never has a sac and so should be approached from the thoracic cavity. I am more and more convinced of the importance of adequate exposure; therefore I am using the thoracic approach more frequently than heretofore.

Operation: I always prefer to use intratracheal positive pressure anesthesia with the patient on the side, the arm suspended and the elbow flexed at right angles, a rib-spreading incision being used between the seventh and eighth and the eighth and ninth interspaces. When the abdominal approach is used we prefer the transverse paracostal incision. When the ring is small, it can easily be enlarged to allow reduction of the contents. When suction is a factor, an easily passed rubber catheter will relieve a vacuum from above or below. I prefer braided silk for suture material, with overlapping of the freshened edges. If any tension is present the phrenic nerve should be crushed; if it still persists, I use the patient's fascia lata for fortification, fixed by interrupted mattress sutures. It is needless to say that caution should be exercised so that neither the esophagus, the stomach nor any other viscus is included in the sutures. In closing the thorax, either from below or above, a catheter should be placed in the thorax and the lung expanded by the anesthetist prior to the placing of the last suture. When the thoracic approach is used, I remove the catheter immediately at closure or within thirty-six to seventy-two hours, unless this is contraindicated, keeping its tip under water for that time. Gastric suction is maintained for seventy-two to ninety-six hours, the patient being fed intravenously. Roentgenographic follow-ups are always indicated, beginning twenty-four hours after the operation.

SUMMARY

1. Attention is invited to the various types of hernias.

2. A method of repair devised to prevent recurrence in inguinal hernias is described.

3. The increase in the incidence of ventral hernia is pointed out.

4. The abandonment of two methods of repair with fascia lata in favor of the current use of metal mesh is noted.

5. The increase in the incidence of diaphragmatic hernia is noted, and a discussion of the approach to and the method of repair is presented.

RÉSUMÉ

L'auteur énumère les types des hernies et décrit sa technique personelle afin de prévenir la formation d'une hernie inguinale récidivée. Il note un accroissement de l'incidence des hernies ventrales et diaphragmatiques. L'auteur préconise l'emploi du maille métallique pour e remplacer la fascia lata dans la réparation des hernies.

RESUMEN

El autor discuten ciertos tipos de hernia y hace notar el hecho de que las recidivas son prevenidas unicamente por atención meticulosa a los detalles. Se da una descripción del método profiláctico personal. So discuten el incremento de la incidencia de hernia inguinaria y diafragmática. En la reparación de las hernias, el autor favorece el uso de la malla metálica en lugar de fascia lata.

RIASSUNTO

L'autore discritto alcuni tipi di ernia e sottolinea il fatto che le recidive possone essere evitate solo da una meticulosa cura nell'osservatore i dettagli. Viene descritto il metodo prophylactico personale. L'autore osserva una elevazione della frequenza dell'ernia inguinale e diaphragmatica e raccomanda l'uso di maglia metalica in luogo di fascia lata per la cura dell'ernia.

SUMARIO

Cortas tipos de hernia são estudatos e uma descricão do metodo di prophylactica e presentado. O autôr salienta o fato de que las recidivas serão evitadas se or detalhes recommendados forem observados. A incidencia de hernia inguinal e diaphragmatica e elevada. Para e cura de hernia, o autôr emprego la malha metalica.

It is one of the peculiarities of medical superstition, that it attributes every ordinary and natural effect to extraordinary and unnatural causes; thus we find in the times of superstitious delusion, that even salutary effects of well known herbs, were attributed to the influence of the planet under whose ascendancy they were collected, rather than any intrinsic property in the herb itself. Every one is acquainted with the solemnity of the ceremonies resorted to by the Druids of our own isle, who were both priests and physicians, in gathering plants for medical purposes. *Black hellebore* was not to be cut, but plucked with the right hand covered with a portion of the robe, then conveyed secretly to the left. *Vervain*, a plant much used in magical operations, was to be gathered at the rising of the *dog star*, when neither *sun nor moon shone*, an expiatory sacrifice of fruit and honey having been previously offered to the earth; when thus prepared. it rendered a person invulnerable, vanquished fevers, was a charm to conciliate friendship, and an antidote to poison.

—*William Wadd, circa 1827*

Nitrous Oxide-Oxygen Anesthesia Supplemented by Levo-Dromoran® Tartrate and Lorfan T.M. Tartrate

PAUL A. RADNAY, M.D.*

JAMAICA, NEW YORK

IN a recent study a colleague and I[1] demonstrated that levo-3-hydroxy-N-allylmorphinan tartrate (levallorphan tartrate)** effectively counteracted respiratory depression induced by levo-dromoran® tartrate (levorphan tartrate)† in 23 surgical patients who had been given this narcotic for supplementation of nitrous oxide-oxygen anesthesia. In these trials levallorphan was administered when the patient's respiration as judged by his respiratory rate, required support. It seemed a matter of interest to investigate whether respiratory depression could be prevented by combining levorphan with levallorphan for supplementation of gas anesthesia. Trials were inaugurated accordingly. The procedure and the results are described in this article.

Case Material, Procedure and Results.—Thirty patients, 10 men and 20 women, were included in the study. Their ages ranged from 56 to 96 years, with an average of 76.1 years.

Table 1 list the operations performed; Table 2, the more important observations on physical examination, other than those which required surgical intervention.

The control respiratory rate of these patients before premedication ranged from 16 to 26 (average 20.2) and the control respiratory minute volume from 4,000 to 10,200 cc. (average 7,223 cc.). The individual measurements, as well as all other data pertaining to medication and respiratory abnormalities, are shown in Table 3.

Sixty minutes before the operation each patient was given an intramuscular injection of atropine sulfate and of a premixed solution of levorphan and levallorphan.* The dose of the former varied from 0.325 to 0.65 mg. (1/200 to1/100 gr.) and that of the latter, in terms of levorphan, from 1 to 3 mg. (average 2.07 mg.).

As can be seen from Table 3, the respiratory rates of the patients, upon arrival in the operating room, ranged from 14 to 24 (average 19.4) and the respiratory minute volumes from 3,850 to 9,000 cc. (average 6,793 cc.). Before initiation of anesthesia all the patients except in Case 20 were given an additional dose of levorphan and levallorphan intravenously, which, in terms of the narcotic, varied from 1 to 2 mg.

In all cases of hip nailing the site of incision was infiltrated with 10 to 20 cc. of a 1 per cent procaine hydrochloride solution.

Anesthesia was initiated with nitrous

From the Department of Anesthesia, Queens General Hospital, Jamaica

*Assistant Visiting Anesthesiologist, Queens General Hospital

**Levallorphan tartrate is the generic designation of 1-3-hydroxy-N-allylmorphinan tartrate (lorfan T.M. tartrate). The compound will be referred to throughout the paper as levallorphan without salt designation

†Levorphan tartrate is the generic designation of 1-3-hydroxy-N-methyl-morphinan tartrate (1-dromoran® tartrate). The compound will be referred to throughout the paper as levorphan, without salt designation.

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*10 cc vials containing 5 mg of levorphan tartrate and 0.5 mg of levallorphan tartrate (Ro 1-4700) per cc were generously supplied through the courtesy of Dr Leo A. Pick of Hoffmann-La Roche, Inc., of Nutley, New Jersey, whose efforts in connection with this project are gratefully acknowledged.

oxide-oxygen and maintained with the gas mixture supplemented by a continuous intravenous drip of a levorphan-levallorphan solution which contained 10 mg. of the narcotic and 1 mg. of the antagonist in 250 cc. of physiologic solution of sodium chloride. The rate of infusion, which was at least 5 drops per minute, varied according to needs. To the patient in Case 20 a dose of 1 mg. of levorphan was given prior to institution of anesthesia, and there was no need for further administration of the narcotic. The total dose of levorphan given in the operating room, i.e., the amount administered before initiation of anesthesia plus that used for supplementation, ranged from 1 to 10 mg. (average 3.91 mg.). The duration of administration varied from two to one-hundred eighty five minutes (average fifty-eight minutes).

In general, the respiratory rate and minute volume were determined every ten to fifteen minutes, but in some cases these measurements were made every five minutes and, if necessary, more often. The minimal and maximal respiratory rates recorded for the 30 patients during the entire period of anesthesia ranged from 8 to 21 (average 14.2) and from 14 to 28 (average 21.7) respectively. The corresponding minimal and maximal respiratory minute volumes were 2,750 to 9,000 cc. (average 5,392 cc.) and 4,800 to 11,200 cc. (average 7,937 cc.). It is noteworthy that the lowest respiratory rate and the lowest minute volume observed in a given patient were not necessarily recorded at the same time. This was true also of the maximal figures for respiratory rate and minute volume. The average respiratory rates and minute volumes calculated from all measurements, including the readings taken when the patients left the operating room, ranged from 10.7 to 24.4 (average 17.7) and from 3,850 to 9,933 cc. (average 6,634 cc.).

In 8 of the 30 cases studied, the respiratory rate dropped to 8 or 10, and this was associated with a marked decrease of minute volume in 6 instances (Cases 4, 10, 20, 21 25 and 26). The average initial respiratory rate and minute volume in these instances were 20.1 and 7,700 cc. respectively. The corresponding average minimal values were 8.7 and 3,525 cc.—a decrease of 56.7 per cent in rate and of 54 per cent in minute volume. To correct this marked depression, additional levallorphan was administered through the infusion tubing. The dose chosen was one-tenth that of the total amount of levorphan given up to that time. The additional dose of levallorphan caused a satisfactory increase of both respiratory rate and minute volume in all patients within forty-five to one-hundred-eighty seconds. The adjustment lasted until termination of anesthesia, except in Case 20, in which, after twenty minutes, the respiratory rate and the minute volume dropped once more. This depression made necessary the administration of a second supplementary dose of levallorphan. In the cases of these 6 patients the corrective measure resulted in respiratory rates ranging from 10 to 18 and in respiratory minute volumes varying from 4,400 to 9,600 cc.

The duration of anesthesia in the 30 patients ranged from twenty-five minutes to three hours and fifty minutes (average two hours). The total amounts of levorphan, including the premedication, varied from 3 to 12 mg. (average 5.98 mg.) and those of levallorphan from 0.3 to 1.6 mg. (average 0.72 mg.). When the patients left the operating room the respiratory rates and minute volumes ranged from 10 to 28 (average 18.3) and from 4,000 to 10,500 cc. (average 6,900 cc.) respectively. Corrective measures in the 2 patients with respiratory rates of 10 (Cases 26 and 29) did not seem indicated, because the minute volumes were fairly adequate, namely 5,500 and 5,000 cc.

Blood pressure readings and pulse rates were recorded throughout anesthesia for all patients. Table 4 lists both the lowest and highest readings of systolic and diastolic pressure, as well as the lowest and highest pulse rates observed in each case. The changes encountered were comparable to those obtained with any other type of general anesthesia.

The other measures pertaining to the anesthetic regimen and the further observations made may be summarized as follows:

The pharyngeal reflex was abolished soon after initiation of anesthesia, and the oral airway was tolerated well. The laryngeal reflex was maintained in all cases during the entire procedure. Endotracheal intubation was facilitated by a 2 per cent pontocaine® hydrochloride spray in the 10 cases in which introduction of a tube was attempted to ascertain the patients' reaction. There was slight spasm in 3 of the cases.

The premixed solution of levorphan-levallorphan was well tolerated. There was free perspiration, however, mainly in the face, in 2 instances (Cases 12 and 19). Nausea and vomiting were not encountered. In general, the depth of anesthesia was satisfactory. The patient in Case 12 became very restless after induction, and this was overcome by the intravenous administration of 50 mg. of thiopental sodium (2 cc. of a 2.5 per cent solution). In Case 20 there was marked lightening in depth of anesthesia after the second dose of levallorphan. Since the surgical procedure was almost completed, 75 mg. of thiopental sodium was administered, and this rendered the patient nonreactive to pain stimuli.

The patients slept a dreamless sleep from which, with a few exceptions, they could be aroused easily at any time during the operation. They answered questions coherently and rationally. When left alone, they went back to sleep. Oscillation of the eyeballs was present in the great majority. The pupils were constricted and the light reflex was present in most cases.

Succinylcholine chloride was used only in Case 17, for opening and closure of the abdomen.

As soon as the mask was removed, all patients either answered questions coherently or responded to tactile stimulation. They were returned to their rooms without complaint of pain.

The postoperative follow-up of the 30 patients by the Department of Anesthesia

TABLE 1.—*Types of Operation*

Operation	*No. of Patients*
Hip nailing	26
Closed reduction of hip fracture	2
Retropubic prostatectomy	1
Amputation of finger	1
Total	30

TABLE 2.—*Abnormalities Other Than Those Requiring Surgical Treatment**

Physical Abnormality	*No. of Cases*
Alcoholism	2
Hypertension	2
Arteriosclerotic heart disease with congestive failure	1
Arteriosclerotic heart disease with hypertension	6
Arteriosclerotic heart disease	11
Senile emphysema	10
Obesity	2
Cerebrovascular accident	2
Chronic bronchitis	3
Diabetes	3
Auricular fibrillation	3
Chronic nephritis	2
Premature ventricular contractions	1
Senile psychosis	1

*Some patients h re [illegible]one of the turbances listed.

TABLE 3.—*Doses of Levorphan Tartrate and Levallorphan Tartrate Given to 30 Surgical Patients; Respiratory Rates and Minute Volumes Before, During and After Anesthesia*

Case	Patient	Sex	Age	Type of Operation	Initial R.R.*	Initial R.M.V.,** cc.	Levorphan Tartrate and Rol-7700; Premedication			Total Levorphan Tartrate and Rol-7700 in Operating Room		Resulting Respiratory Data During Stay in Operating Room	
							Levorphan Tartrate Dose,† mg.	R.R. 1 Hour After Premedication	R.M.V., cc. 1 Hour After Premedication	Levorphan Tartrate Dose,† mg.	Duration of Administration, min.	Minimal R.R.	Minimal R.M.V., cc.
1.	J.S.	M	73	Hip nailing	20	9,600	2	20	9,000	4	50	16	9,000
2.	J.L.	F	81	Hip nailing	20	6,400	2	16	5,650	4	42	16	4,850
3.	J.P.	M	66	Hip nailing	22	8,600	2	22	9,000	10	75	21	8,400
4.	A.M.	F	77	Hip nailing	20	7,000	2	20	5,600	7	185	8	2,800
5.	E.M.	F	89	Hip nailing	20	5,200	2	20	5,000	5	85	16	5,000
6.	A.E.	F	70	Hip nailing	22	8,400	2	20	7,800	5	110	16	5,400
7.	A.B.	F	86	Hip nailing	16	6,800	2	24	6,800	2	43	12	4,200
8.	R.L.	M	73	Hip nailing	22	6,600	2	24	7,200	2	60	20	7,000
9.	I.C.	M	79	Hip nailing	20	9,600	2	20	9,000	5	85	20	8,800
10.	F.S.	F	68	Hip nailing	24	10,200	3	20	8,400	2	16	10	5,000
11.	E.C.	F	72	Hip nailing	16	6,400	2	16	7,000	7	157	12	5,600
12.	P.J.	M	66	Hip nailing	24	8,600	2	22	8,000	9	61	20	7,600
13.	M.G.	F	72	Closed reduction of hip fracture	26	7,800	3	22	8,800	2	33	21	7,800
14.	C.G.	F	96	Hip nailing	16	8,000	2	16	8,000	4	40	16	7,200
15.	R.G.	F	85	Hip nailing	22	6,600	2	18	5,400	4	60	12	3,800
16.	W.B.	M	91	Finger amputation	18	5,400	2	16	5,000	3	30	16	5,000
17.	J.C.	M	82	Retropubic Prostatectomy	22	7,700	2	22	7,500	4	15	12	6,600
18.	L.J.	F	84	Hip nailing	16	5,600	2	16	5,700	4	42	15	4,800
19.	W.R.	M	65	Hip nailing	16	6,400	2	16	6,000	3	5	10	4,500
20.	R.S.	M	61	Hip nailing	19	6,400	3	17	6,200	1	2	8	3,800
21.	E.D.	F	76	Hip nailing	20	5,500	2	20	5,000	4	30	10	2,750
22.	Y.K.	F	88	Hip nailing	20	5,000	2	20	4,000	1.5	55	16	4,000
23.	R.R.	F	72	Hip nailing	20	7,000	2	20	7,200	2	85	18	5,400
24.	K.K.	F	96	Hip nailing	20	4,000	1	20	3,850	2	55	16	3,850
25.	T.McC.	F	61	Hip nailing	20	9,000	2	20	8,700	4	60	8	4,000
26.	L.P.	M	56	Closed reduction of hip fracture	18	8,100	2	14	5,600	2	5	8	2,800
27.	K.McG.	F	80	Hip nailing	24	8,400	2	24	7,200	3	65	16	6,400
28.	K.B.	F	79	Hip nailing	22	7,700	2	22	6,800	2	10	12	4,800
29.	C.B.	F	73	Hip nailing	20	6,700	2	18	7,200	6	120	16	5,600
30.	M.P.	F	67	Hip nailing	20	8,000	2	18	7,200	4	60	10	5,000
Average			76.1		20.2	7,223	2.07	19.4	6,793	3.91	58	14.2	5,392

*R.R. = Respiratory rate. **R.M.V. = Respiratory minute volume. †The dose of levallorphan (Rol-7700) was 1/10th that of levorphan.

TABLE 3 *(Part 2)*—*Doses of Levorphan Tartrate and Levallorphan Tartrate Given to 30 Surgical Patients, Respiratory Rates and Minute Volumes Before, During and After Anesthesia*

Case	Patient	Resulting Respiratory Data During Stay in Operating Room				Additional Levallorphan Tartrate, mg	Time Onset of Effect, sec	Resulting Respiratory Data		Total Levorphan Tartrate, mg	Total Levallorphan Tartrate, mg	Duration of Anesthesia, min	Respiratory Data on Leaving Operating Room	
		Maximal		Average of All Readings										
		R R	R M V cc	R R	R M V, cc			R R	R M V cc				R R	R M V, cc
1	J S	22	11,000	19 4	9,933	—	—	—	—	6	0 6	70	21	10,500
2	J L	16	7,200	16 3	6,075	—	—	—	—	6	0 6	170	16	6,400
3	J P	25	9,000	22 8	8,750	—	—	—	—	12	1 2	95	21	8,400
4	A M	20	7,000	16 5	5,680	0 7	180	14	5,600	9	1 6	230	18	6,300
5	E M	24	6,000	20 6	5,425	—	—	—	—	7	0 7	150	20	5,500
6	A E	24	8,400	20	7,400	—	—	—	—	7	0 7	155	20	8,400
7	A B	24	7,800	15 9	6,143	—	—	—	—	4	0 4	105	20	7,000
8	R L	28	7,200	24 4	7,040	—	—	—	—	4	0 4	85	24	7,200
9	I C	24	9,600	22	9,166	—	—	—	—	7	0 7	70	22	8,800
10	F S	20	8,400	16 1	7,400	0 5	45	18	8,100	5	1 0	130	19	8,700
11	E C	20	11,200	14 8	7,090	—	—	—	—	9	0 9	200	16	7,000
12	P J	25	9,200	23 1	8,480	—	—	—	—	11	1 1	90	20	7,600
13	M G	26	9,600	23 2	8,650	—	—	—	—	5	0 5	25	21	8,400
14	C G	20	9,600	18	7,866	—	—	—	—	6	0 6	135	18	7,200
15	R G	20	6,400	16 6	5,133	—	—	—	—	6	0 6	120	18	6,400
16	W B	18	6,300	17 2	5,650	—	—	—	—	5	0 5	50	18	5,000
17	J C	22	8,000	14 8	7,140	—	—	—	—	6	0 6	35	16	8,000
18	L J	16	7,200	15 8	6,083	—	—	—	—	6	0 6	160	16	6,400
19	W R	24	6 800	14 5	5,743	—	—	—	—	5	0 5	80	16	6,000
20	R S	18	9,600	13 8	6,680	0 4 0 4	120 90	18 16	9,600 9,600	4	1 2	75	16	6,400
21	E D.	32	6,400	15 4	4,200	0 6	150	16	5,200	6	1 2	185	11	5,600
22	Y K	24	7,200	18 1	5,200	—	—	—	—	3 5	0 35	120	16	4,800
23	R R	24	7,200	20 1	6,950	—	—	—	—	4	0 4	200	22	6,600
24	K K	20	4,800	18 8	4,200	—	—	—	—	3	0 3	65	20	4,000
25	T McC.	20	9,600	13 6	6,200	0 6	120	10	5,500	6	1 2	115	14	7,000
26	L P	14	7,000	10 7	3,850	0 4	65	10	4,400	4	0 8	105	10	5,500
7.	K McG	28	8,400	21 4	7,000	—	—	—	—	5	0 5	100	28	8,200
8	K B	24	8,400	16	6,950	—	—	—	—	4	0 4	155	24	8,400
29	C B.	24	7,200	18 4	6,600	—	—	—	—	8	0 8	170	10	5,000
0	M P	16	6,400	13 8	6,350	—	—	—	—	6	0 6	140	14	6,300
	Average	21 7	7,937	17 7	6,634	—	—	—	—	5 98	0 718	119 5	18 3	6,900

TABLE 4.—*Range of Blood Pressure and Pulse Rates*

Case	Systolic Pressure, Mm. of Mercury		Diastolic Pressure, Mm. of Mercury		Pulse Rate	
	Lowest	Highest	Lowest	Highest	Lowest	Highest
1	126	150	86	100	84	110
2	80	120	60	80	108	120
3	138	164	90	106	108	132
4	100	178	60	80	100	124
5	108	160	70	84	84	120
6	138	160	56	70	72	100
7	110	140	64	80	78	84
8	138	160	80	98	104	126
9	120	140	76	84	96	112
10	114	180	90	110	84	120
11	134	164	84	90	90	110
12	138	164	90	104	108	132
13	184	190	84	88	124	132
14	150	190	90	110	116	132
15	100	150	52	66	80	96
16	168	230	120	130	84	108
17	122	150	64	80	68	72
18	80	120	60	80	108	120
19	106	130	66	84	84	100
20	190	210	90	110	90	120
21	100	126	64	80	100	116
22	140	156	64	100	78	110
23	70*	156	54*	78	80	110
24	120	166	64	84	100	104
25	96	114	56	70	98	116
26	120	130	84	90	116	120
27	140	196	104	130	100	120
28	154	190	96	120	90	120
29	120	150	80	100	80	100
30	92	136	52	60	90	100
aver.	123.2	159	75	91.5	93.4	112.8

*Drop in blood pressure due to severe hemorrhage.

extended over seventy-two hours, during which period the following observations were made:

With 3 exceptions, all patients continued to sleep for four to eight hours. Two patients (Cases 1 and 29) slept for sixteen and twenty-four hours respectively, and 1 patient (Case 23) stayed awake. Although the respiratory rate of the patient in Case 1 remained at 21 or above and the respiratory depth seemed adequate, he became cyanotic twelve hours after he had left the operating room. His blood pressure in millimeters of mercury fell to 80 systolic and 50 diastolic, and his pulse rate was 124. Examination revealed a partially obstructed airway with greatly increased secretions from the salivary glands and in the tracheobronchial tree. The cyanosis disappeared after thorough suction and after a patent airway had been secured. The drop in blood pressure was treated with vasoxyl® hydrochloride of which 10 mg. (0.5 cc.) were given by slow intravenous injection followed by the same dose administered intramuscularly. Within five minutes the blood pressure reading was 130 systolic and 86 diastolic, and it remained at that level. The patient made an uneventful recovery. In Case 29 there was no respiratory or circulatory depression during the long period of sleep, from which the patient could be easily awakened for feeding.

The respiratory rate of all patients was determined also at frequent intervals during the postoperative period. A decrease occurred in 2 instances (Cases 9 and 26). In the former the rate, which was 22 at termination of anesthesia, dropped to 14 two hours later. There was no need, however, for corrective measures. The patient in Case 26 left the operating room with a respiratory rate of 10 and this decreased to 6 after three hours. A dose of 0.4 mg. of levallorphan, given intravenously, raised the respiratory rate to 14 within sixty seconds. Thereafter, the rate remained at least at this level.

Twenty-four patients (80 per cent) required no analgesic medication for twelve

hours after the operation.

There was no fatality during the seventy-two hour period of observation by the Department of Anesthesia.

COMMENT

In the 30 patients studied, an average of 2.07 mg. of levorphan premixed with 0.207 mg. of levallorphan and administered intramuscularly as premedication, produced only an insignificant reduction of respiratory rate and minute volume. After anesthesia had been instituted and 5.98 mg.* of levorphan and 0.718 mg.** of levallorphan given, the average respiratory rate (calculated from all readings, including the measurements taken when the patients left the operating room) was decreased by approximately 12 per cent and the minute volume by 8 per cent as compared with the average control values. The average respiratory rate of all 30 patients at the time they left the operating room (18.3) was approximately 9.4 per cent lower, and the average minute volume (6,900 cc.) about 4.5 per cent lower, than the initial values.

If the 24 patients who did not require additional injections of levallorphan are considered alone, their average control respiratory rate was 20.2. After they had received an average total dose of 6.06 mg. of levorphan premixed with 0.606 mg. of levallorphan, their average minimal respiratory rate was 15.6, a reduction of 22.7 per cent. If all measurements of respiratory rate for these 24 patients are averaged, the resulting figure is 18.58, a drop of 8 per cent as compared with the control values.

In a previous series[1] the average respiratory rate in 23 similar cases fell by approximately 56 per cent after the patients had been given an average of 6 mg. of levorphan without levallorphan for premedication and supplementation. This proves that the addition of a dose of levallorphan one-tenth that of levorphan prevents, to a large extent, narcotic-induced depression of the respiratory rate.

There were 6 cases, however—Cases 4, 10, 20, 21, 25 and 26—in the present series in which an average control respiratory rate and minute volume of 20.1 and 7,770 cc. dropped to an average minimum of 8.66 and 3,525 cc. respectively after an average total dose of 5.33 mg. of levorphan in combination with 0.533 mg. of levallorphan. This is a decrease of almost 57 per cent in rate and 54 per cent in minute volume. An average dose of 0.53 mg. of levallorphan raised the average respiratory rate to 14.3 and the average minute volume to 6,400 cc. These values indicate that the additional dose of the narcotic antagonist considerably improved respiratory function, but the average rate was still 28 per cent lower and the average minute volume 17 per cent lower than the average control values. It appears, then, that the effect of levorphan on respiration must be carefully observed even if a dose of levallorphan is added which, in general, prevents narcotic-induced respiratory depression.

Gross and Hamilton[2] reported the cases of 4 surgical patients who, after having received levorphan and levallorphan simultaneously in a 10:1 ratio as part of the anesthetic procedure, showed a decrease in respiratory rate of 56 per cent and in minute volume of 50 per cent. Additional doses of levallorphan, however, provided "further antagonism of the depression." The impression of these authors was that the 10:1 ratio is a "borderline ratio." This is not borne out by my study, since the maximal decreases of respiratory rate and minute volume in the 24 patients who were given the two drugs at the 10:1

*This figure represents the average total dose of levorphan per patient given intramuscularly as premedication and intravenously, both before institution of anesthesia and as a supplement during its maintenance

**This figure represents the average total dose of levallorphan per patient given together with levorphan (as premedication, before institution of anesthesia and as supplement during anesthesia) and separately in the 6 instances in which further support of respiration was required

and did not receive additional doses of levallorphan were 22.7 per cent and 17.5 per cent respectively. When these patients left the operating room, their average respiratory rate was reduced by 6.6 per cent and their average minute volume by 1.8 per cent, as compared with the average control values.

As was shown, if all measurements of respiratory rate made for these 24 patients during the entire surgical procedure are averaged, the resulting figure is 8 per cent lower than the average initial respiratory rate. Similarly, the average minute volume calculated from all readings obtained in these 24 cases (6,876 cc.) is 3.2 per cent below the average control value. All these measurements indicate that a dose of levallorphan one-tenth that of levorphan prevented narcotic-induced respiratory depression. Similar observations were reported by Cullen and Santos[3] in unanesthetized patients with chronic pain who had been given the two drugs conjointly. Obviously, however, there are some cases, e g., the 4 reported by Gross and Hamilton[2] or the 6 in the present series discussed in which comparatively larger doses of the antagonist are required. One may assume, therefore, that there is greater sensitivity to the respiratory-depressing effects of narcotics in some patients than in others. Swerdlow and his co-workers[4] concluded from their investigations of unanesthetized patients that levallorphan offers considerable protection against nisentil (alphaprodine) hydrochloride induced respiratory depression. Foldes and his collaborators[5] have recently reported that levallorphan given together with or prior to alphaprodine for supplementation of nitrous oxide-oxygen anesthesia prevented depression of respiration, so that unusually large doses of the narcotic-analgesic could be administered with impunity.

Thus there can be no doubt that levallorphan antagonizes the narcotic-induced depression of respiration. A colleague and I have shown in a previous series (Radnay and Hechter[1]) that a reduction of respiratory rate produced by levorphan was counteracted by an average dose of levallorphan approximately 10 per cent of that of the narcotic. It is obvious from the data presented in this paper that the conjoint administration of levorphan and levallorphan in a 10:1 ratio prevents respiratory depression to a large extent in most cases, as judged by measurements of respiratory rate and minute volume.

Levallorphan was selective in its action, in that it did not interfere with the analgesic effect of levorphan. This was evidenced by the fact that there was no significant decrease in depth of anesthesia except in the patient in Case 20, who had been given a comparatively large dose of the antidote (4 mg. of levorphan and 1.2 mg. of levallorphan—a 3.3:1 ratio).

It is suggested that the type of anesthesia described should not be administered to patients who have respiratory difficulties or who are suffering from shock or circulatory failure Similarly, patients who are severely anemic or whose oxygen-carrying capacity is greatly impaired for other reasons should not be given overdoses of levorphan even in combination with the antidote. Nor does it seem advisable to administer levorphan to patients who undergo operations of short duration. Moreover, large doses should be administered only under very careful observation. In cases of somewhat impaired hepatic or renal function, however, the levorphan-levallorphan mixture did not seem to have any adverse effect.

It is suggested that when there is need for support of respiration the additional dose of levallorphan should be 10 per cent of the total dose of levorphan administered. Overdoses of the antidote may cause prolonged depression or other untoward effects.

SUMMARY AND CONCLUSIONS

A study of 30 surgical patients is presented After they had been premedicated with atropine and a mixture of 1-dromoran® (levorphan) and lorfan™ (levallorphan) in a 10 1 ratio, nitrous oxide oxygen anesthesia was administered, supplemented by slow intravenous infusion of the narcotic-antagonist combination

The dose of levallorphan used gave *adequate protection against levorphan-induced respiratory depression* in 24 cases After these patients had been given an average total dose of 6 06 mg levorphan premixed with 0 606 mg of levallorphan, the average of maximal decreases of respiratory rate and minute volume were 22 7 per cent and 17 5 per cent respectively When these patients left the operating room the corresponding figures were 6 6 *per cent and 1 8 per cent lower than the* initial control values

Since, in a previous series, 6 mg of levorphan without the antagonist produced a 56 per cent drop of respiratory rate, and since in 6 cases of the present series additional levallorphan had to be given to support respiration, it is concluded that a dose of levallorphan one tenth that of levorphan largely prevents narcotic-induced *respiratory depression in most cases*

At the 10 1 ratio, the antagonist did not interfere with the depth of nitrous oxide-oxygen anesthesia supplemented by levorphan

Author's Note The assistance of Miss Valida Cousineau, R N, anesthetist, in connection with this study is gratefully acknowledged

RESUMEN Y CONCLUSIONES

Se *presentan treinta pacientes* Despues de ser premedicados con atropina y una mezcla de 1—Dromoran® (levorphan) y Lorphan T M (levallorphan) en una relacion de 10 1, se les administro anestesia con oxido nitroso y oxigeno, complementada por una infusion lenta de una combinacion narcotica antagonista por via intravenosa

La dosis de levallorphan que se usó dio *una proteccion adecuada contra la accion* depresiva de la respiracion del levorphan, en 24 casos Despues de que se les habia administrado a los pacientes una dosis total de 6 06 mg de levorphan mezclado con 0 606 mg de levallorphan, la disminucion de la frecuencia respiratoria promedio y del volumen minuto fue de 22 7 por ciento y 17 5 por ciento respectivamente Cuando los pacientes abandonaron la sala de operaciones la cifras correspondientes fueron de 6 6 por ciento y de 1 8 por ciento menores a las controles

Debido a que, en casos previos 6 mg de levorphan sin antagonista produjeron una caida de 56 por ciento en la frecuencia respiratoria, y ya que, en 6 casos de la presente serie una dosis de levallorphan adicional evito la depresion, se concluye que la dosis de levallorphan a un decimo de la de levorphan evita en forma notable la depresion respiratoria en la mayoría de los casos

En una relación de 10 1 el antagonista no interfiere con la profundidad de la anestesia de oxido nitroso complementada con levorphan

SUMARIO E CONCLUSOES

Trinta pacientes cirurgicos são apresentados Depois de terem sido premedicados com atropina e com uma mistura de l-Dromoran® (levorfan) e Lorphan T M (levalorfan) em uma escala de 10 1, foi administrada anestesia de oxigênio-óxido nitroso, suplementada por infusão intravenosa lenta de combinação antagonista-narcótica

A dose de levalorfan usada deu proteção adequada contra a depressão respiratoria causada pelo levorfan em 24
Depois de se ter dado a êsses p

uma dose total média de 6.06 mg. de levorfan premisturado com 0.606 mg. de levorfan, a média das diminuições máximas de ritmo respiratório e volume minute foram 22.7% e 17.5% respectivamente. Quando êsses pacientes deixaram a sala de operação os números correspondentes foram 6.6% e 1.8% inferiores aos valores iniciais de controle.

Uma vez que, em uma série anterior, 6 mg. de levorfan sem o antagonista produziu uma queda de 56% de rítmo respiratório e uma vez em 6 casos da série presente teve que se dar levorfan adicional para auxiliar a respiração, conclui-se que uma dose de levalorfan 1-10 de la levorfan impede a depressão respiratória causada pelo narcótico na meioria dos casos.

Na escala de 10:1, o antagonista não intereferiu com a profundidade da anestesia de oxigênio-óxido nitroso suplementado por levorfan.

RÉSUMÉ ET CONCLUSIONS

Trente cas chirurgicaux sont présentés. Après avoir reçu de l'atropine et un mélange de 1-Dromoran® (levorphan) et de lorphan T.M. (levallorphan) en solution de 10:1, une anesthésie au protoxyde d'azote fut appliquée complétée par une lente infusion intraveineuse d'une combinaison de narcotique antagoniste.

Dans 24 cas la dose de levallorphan utilisée a assuré une bonne protection contre la dépression respiratoire provoquée par le levorphan. Après une dose totale de 6,06 mg de levorphan additionné de 0.606 mg de levallorphan, la moyenne maximum de diminution du taux respiratoire et du volume/minute a été respectivement de 22,7 et de 17,5%. Au sortir de la salle d'opération les chiffres correspondants étaient respectivement de 6,6 et de 1,8% inférieurs aux valeurs de contrôle.

Etant donné que dans une série de cas précédents 6 mg de levorphan sans antagoniste avaient produit une diminution de 56% du taux respiratoire, et que dans 6 cas de la présente série il a fallu administrer une dose supplémentaire de levallorphan afin de soutenir la respiration, l'auteur conclut qu'une dose de 1/10 de levallorphan par rapport au levorphan suffit amplement à prévenir la dépression respiratoire provoquée par les narcotiques dans la plupart des cas.

A la dose de 10:1 l'antagoniste n'a eu aucune action sur la profondeur de l'anesthésie au protoxyde d'azote-oxygène complétée par le levorphan.

CONCLUSIONI RIASSUNTIVE

Vengono presentati 30 pazienti chirurgici. Dopo una premedicazione con atropina e una miscela di 10 parti di 1-Dromoran (levorphan) e una parte di Lorphan T. M. (levallorphan), fu praticata un'anestesia con protossido d'azoto e ossigeno cui fu aggiunta la lenta infusione endovenosa della miscela dei du narcotici antagonisti. La dose di levallorphan usata riuscì ad evitare, in 24 casi, la depressione del centro respiratorio indotta dal levorphan. In questi pazienti con una dosë totale media di 6.06 mg. di levorphan associati a 0.606 mg. di levallorphan, la maggior diminuzione della frequenza respiratoria e del volume per minuto fu rispettivamente del 22,7% e del 17,5%. All'atto di lasciare la camera operatoria i suddetti valori furono del 6,6% e dell'l, 8% più bassi dei valori iniziali. Dato che, in una precedente serie di pazienti, la somministrazione di 6 mg. di levorphan senza l'antagonista aveva prodotto una diminuzione del 56% del tasso respiratorio, e dato che in 6 casi della presente serie di pazienti fu dovuta aggiungere dell'altro levallorphan per sostenere la respirazione, si può concludere che il levallorphan, somministrato in dosi di l a 10 rispetto al levorphan, è in grado di prevenire nella maggioranza dei casi la depressione respiratoria indotta dai nar-

cotici. Nè, sempre alla dose di 10 a 1, l'antagonista influisce in alcun modo sulla profondità dell'anestesia causata dal protossido d'azoto e ossigeno e dal levorphan.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Es wird uber 30 chirurgische Kranke berichtet, bei denen nach Vorbehandlung mit Atropin und einer Mischung von 1-Dromoran-R (Levorphan) und Lorphan T.M. (Levallorphan) im Verhaltnis 10:1 eine Narkose mit Stickoxydul-Sauerstoff, mit zusatzlicher langsamer intravenoser Infusion der narkotisch-antagonistischen Kombination angewandt wurde.

In 24 Fallen bot die verabreichte Dosis von Levallorphan ausreichenden Schutz gegen die durch das Levorphan hervorgerufene Atmungsdepresseion. Bei diesen Kranken betrug nach Verabreichung einer durchschnittlichen Gesamtdosis von 6,06 mg Levorphan gemischt mit 0,606 mg Levallorphan der durchschnittliche maximale Abfall der Atmungszahl 22,7% und der des Minutenvolumens 17,5%. Beim Verlassen des Operationssaales lagen bei diesen Kranken die entsprechenden Zahlenwerte 6,6% und 1,8% unterhalb der anfanglichen Kontrollwerte.

Da in einer fruheren Serie 6 mg Levorphan ohne den Antagonisten ein Absinken der Atmungsquote von 56% hervorriefen, und da in sechs Fallen der vorliegenden Serie zusatzliches Levallorphan verabreicht werden musste, um die Atmung zu stutzen, wird geschlossen, dass eine Levallorphandosis, die einem Zehntel der Levorphandosis entspricht, in den meisten Fallen bei weitem ausreicht, eine durch das Narkotikum hervorgerufene Atmungsdepression zu verhuten.

Der im Verhaltnis von 10:1 verabreichte Antagonist beeintrachtigte nicht die Tiefe der durch Levorphan erganzten Stickoxydul-Sauerstoff-Narkose.

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World peace cannot be attained until we build peace into the hearts and minds of men. Since physicians are the most intimately acquainted with the physical and mental needs of their patients, they are the most logical engineers for this great moral construction project If we more than half a million physicians assume this task on an individual, personal basis, we may yet succeed where soldiers, statesmen and politicians have previously failed.

—*Gunderson*

A Clinical and Surgical Contribution to the Correction of Right-Sided Abdominal Pain

B. RAYMOND WESTON, M.D., F.A.C.S., F.I.C.S.

MASON CITY, IOWA

MANY clinical points of great value are transmitted only conversationally and never reach the profession as a whole. This is true particularly of the causes of right-sided abdominal pain in the cases to be considered here. The clinical picture described in this article has frequently been encountered by competent surgeons without recognition and without correction. This has occurred many times in the cases in which I have operated and, of course, in many others I have not observed. As new physicians have come into the group and hospital staff I serve, they have been somewhat skeptical of this clinical picture, if not actually opposed to the type of operation utilized in correcting it. Without exception, the entire staff and, in fact, physicians in the entire referring area have been alerted to this problem by observation and personal experience. One of the difficulties has now become the too optimistic referral, with this diagnosis, of all types of pain in the right lower abdominal quadrant. A description of the condition, which we call "mechanical appendix" whether the appendix is present or has been removed, must of necessity be detailed and possibly boring. Such a description is necessary, however, to a proper grasp of the entity.

To the best of my knowledge, no correlation of the conditions here described as "mechanical appendix" has been presented in literature before, except in an article of my own in the *Iowa State Medical Journal* of November 1942. It is presented now because of my conviction that it should reach a wider group of medical men. The original interest in this condition stemmed from observing a series of patients in four general groups. The first group consisted of patients who were erroneously operated on for appendicitis and who had no further difficulty. Previously these patients had had the symptom complex aforedescribed, and, in spite of the fact that no pathologic condition was demonstrable at operation, their symptoms disappeared permanently.

The second group comprised patients of the same type with the same story of erroneous appendectomy, but they were not benefited, their symptoms continuing indefinitely.

The third group was composed of patients of the so-called spastic colon type, who were in no way improved by belladonna, phenobarbital, metamucil, or any of the other drugs ordinarily used in treating this condition. These patients were not neurotic, and their story was convincing. They did have pain that was annoying, and they did have pain that fitted into the general clinical picture here described.

The fourth group represented was a series of complete ptosis operations that I had performed according to the teachings of Dr. Coffey, in which the stomach and the right and transverse portions of the colon were suspended. The operation as a whole was soon given up as useless, but it was very striking that many of the patients who had had persistent right-sided

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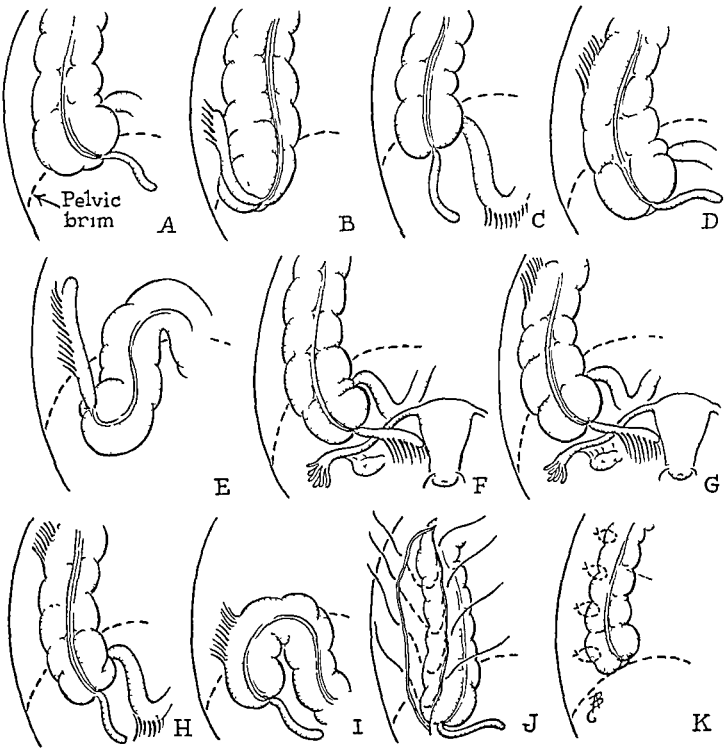
pain were cured by the radical repair of ptosis including the right half of the colon. I have no intention of recapitulating the differential diagnosis of right-sided abdominal pain, often referred to in the past as "chronic appendicitis and/or spastic colon." It is assumed that proper diagnostic procedures were utilized to eliminate pains of renal or pelvic origin. Essentially the patient complained of persistent nagging pain localized to the right lower quadrant of the abdomen or to the right midabdomen. Many of them noted that this pain was relieved by lying down for a short time during the day and disappeared completely when they retired at night. There are, of course, many variations of this pain pattern, which must be carefully evaluated. Frequently the patient notes recurrence of the pain five to ten minutes after arising in the morning; on the other hand, many patients are free of pain until later in the day's activity. Commonly the pain is described as a "steady ache," well localized and associated with tenderness in the region of the right side of the colon. The patient may describe a "catch" in the side while running or engaging in strenuous exercise. He frequently dates the onset of his difficulty to childhood, with persistence of symptoms during adult life. The pain may persist for only a part of each day, or may bother the patient persistently for several days at a time. In the fully developed clinical picture the patient may volunteer the information that on those days when he has been particularly active and ambulatory, the pain is most severe and is frequently associated with nausea. In none of my cases has a patient complained of vomiting. From a physical and diagnostic standpoint, in fact, there was little of clinical note in the majority of cases. It was noted, however, that many of the persons with the pattern described could be relieved of their pain by assuming the knee-chest position or simply by lying on the back, with some elevation of the buttocks. Frequently, on pelvic examination of female patients, a redundant cecum lying within the pelvis could actually be palpated. During the more painful periods an elevated white cell count was noted, but there was little increase in polymorphonuclears. Radiologically it was possible to obtain considerable confirmatory evidence in the cases of these patients. The most important single item was that they universally reported the tenderness to be at the tip of the cecum. At times it was reported as occurring at other points in the right half of the colon, but at operation there was usually a distortion or folding of the colon which showed the point of tenderness to be at the tip of the cecum. Ptosis of the right half of the colon, as shown by roentgenogram, was another point of value. A persistent pulling down of the terminal portion of the ileum into the pelvis was also observed in certain groups of these patients. Associated with this would be any abnormal angle between the cecum and the terminal portion of the ileum. It was from our observation of patients with the clinical history, physical signs and roentgen evidence aforementioned that the rational approach to this specific type of pain in the right lower quadrant of the abdomen was derived.

Anatomic Background. — The anatomic aspects of the ileocecal region must be briefly reviewed in order to understand the rationale for the surgical therapy of this symptom complex. Normally the greater portion of the cecum, ascending colon and appendix are peritonealized. The posterior and lateral portion of the peritoneum fuses with the parietal portion, so that the ascending colon lies essentially retroperitoneal. In normal position retroperitoneal fixation of the asce colon suspend c appendi. or just abo ig

lower quadrant. The normal mesoappendix lies as a triangular fold, extending from the terminal portion of the ileum to the cecum, with its free border pointing laterally. In normal position it lies essentially free and contains the appendiceal artery. There is a secondary ileal fold running in this area to the anterior surface of the cecum, near the appendix. A blood vessel enters this fold at either end. I have not been able to find a proper anatomic name for this structure, and I shall term it the anterior ileocecal fold. Normally the ileum enters the cecum on its medial aspect in essentially a right angle position. The appendix, of course, in its normal position, lies free at the lower margin of the cecum. There is no dearth of anatomic variation in this area, and it is my opinion that alterations of the normal anatomic picture as described can, on occasion, cause definite right-sided pain. The majority of anatomic errors or congenital abnormalities in this region are secondary to abnormalities of fixation of the right half of the colon. In addition to the two more or less normal folds I have described, I have encountered cases in which there were congenital peritoneal bands that seemed to bind the cecum or the terminal portion of the ileum in such a manner as to hold it into the pelvis. On occasion these peritoneal bands may simply be postoperative adhesions resulting from either appendiceal or pelvic surgical procedures. It has been noted in some of these cases that the cecum remains completely in a pelvic position, no matter what postural change is made by the patient. It may be mentioned here that a patient with this condition frequently gets little relief from positional change and notes aggravation of his symptoms on rising, bending and straightening. The angle of entrance between the ileum and the cecum is frequently distorted; this may also be observed after a barium enema. The accompanying illustration schematically pictures some of the more common abnormalities I have attempted to describe.

Sketch *A* shows the normal anatomic picture of the ileocecal region as depicted in Gray's *Anatomy.* In Sketch *B* ptosis of the right colon is shown in relation to the pelvic brim (illustrated by the dotted line) with a subserosal retrocecal appendix maintaining an abnormal tension upon the cecum. In sketch *C,* fixation of the terminal portion of the ileum, with bandlike adhesions causing ptosis of the cecum into the pelvis, is demonstrated. Sketch *D* illustrates a ptotic cecum, with lateral lines of tension high on the ascending portion of the colon. Sketch *E* shows marked ptosis of the right half of the colon with a lateral and superior attachment of the appendix causing extreme tension and stretch in the lateral sulcus. In Sketch *F,* fixation of the appendix or the terminal portion of the ileum to the pelvic adnexal structures, either by inflammation or by previous surgical adhesions, is illustrated. Sketch *G* is an essentially similar illustration, except that there are countertension lines of irregular peritoneal folds pulling from above. In Sketch *H* a downward pull of the attached terminal portion of the ileum is apparent, opposing the lines of stress pulling upward along the lateral sulcus. Sketch *I* once again illustrates the stress lines as applied to the lateral aspect of the cecum, with the attachment low on a completely ptosed right colon.

Rationale for Surgical Intervention.— It is my conviction that the common cause of painful right-sided ptosis may be illustrated by an example frequently used in describing the situation to patients. If a person hangs by both hands from a trapeze bar, the arms would eventually become fatigued and the grip would have to be released, but there would be no involvement in essential pain. Suppose, however, that the person should be able



Artist's sketches indicating normal and pathologic aspects of the right side of the abdomen, as related to right-side abdominal pain (see text).

to hold his weight with only one finger; not only would he lose his support quickly but there would be marked pain associated with the effort. In other words, generalized ptosis, such as is frequently encountered, rarely if ever causes severe discomfort to the patient. Partial ptosis or incomplete ptosis, however, associated with tension bands of peritoneum or bands of congenital origin around the ileocecal valve, may narrow the point of ptosis to such a small area that pain results. Relief of this abnormal suspension by assumption of a position that releases it definitely results in disappearance of the pain. If pelvic fixation secondary to adhesions or bands running deep into the pelvis prevents return of the structures to normal position at any time, the pain may be relieved by positional change. fore it has be eling that r tion of the al position

release of all pelvic attachments in this particular type of case will result in a satisfactory relief of the pain described.

Surgical Technic.—The incisional approach to the operation described here may be through a midline suprapubic incision if other surgical procedures are contemplated, or a lower paramedian incision, approximately 4 inches (10 cm.) long but definitely allowing adequate exposure of the entire right half of the colon. General examination of the abdomen is, of course, imperative. When ptosis of the cecum and the right side of the colon has been located, the initial maneuver consists of elevating the cecum from the pelvis to ascertain whether there are any adherent bands or malpositioning of these structures that would prohibit return of the cecum to normal position. Accentuating the ptosis by pulling the cecum into the pelvis may demonstrate abnormal lines of tension along the lateral aspect of the ascending portion of the colon or along a retrocecal or subserous appendix. These are the so-called tension lines of Coffey and are frequently rather bright red, possibly owing to inflammatory changes secondary to the persistent tension. Evaluation of the ileocecal juncture and the position of the ileum in relation to the cecum is, of course, vital. It is assumed that any other pathologic conditions will be handled accordingly. The appendix, if present, is removed, and any binding by the aforedescribed ileocecal bands is released. Any adherent portions of the cecum or the appendix in the pelvis are freed. When these procedures have been accomplished, a modified Coffey purse-string suspension of the cecum and ascending colon is carried out. The colon and cecum are grasped gently with a rubber-tipped forceps, the usual point of application being at the lower portion of the cecum and the hepatic flexure. This forceps is utilized to rotate the colon and cecum medially and to allow freeing of the lateral sulcus attachments. Multiple purse-string sutures placed in the margin of the rotated surface of the ascending portion of the colon below the hepatic flexure, and two or three superficial bites of the retroperitoneal and lateral peritoneal structures adjacent to the colon are taken, the suture ending in the posterolateral peritoneal margin near the lower aspect of the right lobe of the liver. Several of these sutures may be required to complete the suspension. An illustration of the placement of these sutures is noted at *I* in the accompanying line drawing. The most inferiorly placed suture should, of course, serve to elevate the cecum to normal position. When these sutures have been tied, as illustrated in Sketch *K*, the cecal tip should lie at the level of the pelvic brim posteriorly and laterally. I have noted that a retrocecal appendix is frequently associated with this condition, and in many instances have been of the opinion that simple removal of a long retrocecal or subserosal appendix might well relieve the pain described by the patient. In fact, it is my opinion that in many instances this condition represents a true "mechanical appendix," and removal of this structure has been accomplished by surgeons who were in no way aware of the reason for the patient's relief from pain. It is true that, in many instances, simply freeing the pericecal or peri-ileal bands aforedescribed may reasonably lead to relief of the patient's complaints. When I have operated on these patients, however, I have always performed the concomitant suspension as described. During the early period of observation I was inclined to hospitalize them at bed rest for approximately one week, but at present they are allowed to be up and around the day after the operation, and there has been no change in the postoperative course. Admittedly it is difficult in some instances to

evaluate this condition preoperatively, and I do not carry out this procedure unless the basic criteria described for diagnosis are fulfilled. The procedure itself is relatively simple and associated with very little morbidity. There have been no deaths in approximately 1,000 surgical cases. The final results have been completely satisfactory except when a misdiagnosis was made preoperatively or the operation has been improperly performed.

CONCLUSIONS

1. An uncommonly recognized clinical cause of persistent or recurrent pain in the right lower abdominal quadrant is described.

2. The diagnosis of this condition, its apparent cause and its surgical correction are presented.

3. Uniformly satisfactory results have been noted in all cases unless diagnosis was incorrect or improper surgical technic was employed.

SCHLUSSFOLGERUNGEN

1. Eeine nicht allgemein bekannte klinische Ursache dauernder oder wiederkehrender Schmerzen in der rechten unteren Bauchgegend wird beschrieben.

2. Die Diagnostik, die offenbare Ursache und die chirurgische Behebung des Zustandes werden dargestellt.

3. Die Erfolge waren in allen Fällen gleichmässig zufriedenstellend, soweit nicht eine falsche Diagnose vorlag oder eine unzulängliche Technik angewendet wurde.

CONCLUSIONI

1. Viene descritta una causa raramente diagnosticata di dolore persistente e ricorrente nel quadrante inferiore destro dell'addome.

2. Viene suggerita la diagnosi di questa affezione e la sua cura chirurgica.

3. Si sono ottenuti risultati sempre buoni, a meno che la diagnosi non fosse errata o la tecnica chirurgica scorretta.

CONCLUSIONS

1. Une cause clinique rarement reconnue de douleur persistante ou récidivante du quadrant abdominal inférieur droit est décrite.

2. Le diagnostic de cet état, sa cause apparente et son traitement chirurgical sont présentés.

3. Des résultats satisfaisants ont été notés dans tous les cas, sauf lors de diagnostic erroné ou d'une technique chirurgicale inadéquate.

CONCLUSIONES

1. Se describe una causa rara de dolor recurrente en el cuadrante inferior derecho.

2. Se presenta al diagnóstico del padecimiento, su causa aparente y su tratamiento quirúrgico.

3. En todos los casos se observan buenos resultados a menos de que el diagnóstico sea incorrecto así como la técnica quirúrgica empleada.

CONCLUSOES

1. Uma causa clínica não comumente reconhecida de dor recorrente no quadrante inferior direito é descrita.

2. *O diagnóstico dessa condição, sua* causa aparente e correção cirúrgica são apresentados.

3. Resultados uniformemente satisfatórios foram notados em todos os casos, menos quando o diagnóstico foi incorreto ou a técnica cirúrgica inadequadamente empregada.

Surgical Aspects of Protein Metabolism

WILLIAM R. BOND, M.D.*

RICHMOND, VIRGINIA

NOTWITHSTANDING the vast amount of information that has accumulated as to the manner in which foodstuffs are ultimately prepared in the digestive tract for absorption and assimilation, knowledge of pancreatic enzymes and the acinar cells that secrete them is exceedingly limited. This rather tragic situation can be attributed principally to the lack of any dependable method of detecting the existence of a deficiency in enzyme secretion and the apparent reluctance of the human race to deviate from traditional and "accepted" views handed down from text to text and from generation to generation.

It would seem quite conservative to state that in less than 50 per cent of the cases of severe and often fulminating acute pancreatitis is the condition correctly diagnosed, and even then reliance is placed upon a simple laboratory procedure, estimation of the serum amylase level. This test is of little or no value, however, after forty-eight hours; and, should the patient recover, there is no simple means of ascertaining the extent of pancreatic damage that remains and may manifest itself in later years.

The effect of sudden and complete occlusion of the pancreatic ducts or suppression of enzyme secretions is suggestive of shock and toxemia. Many of the symptoms and signs are such as might easily be reproduced experimentally by injecting certain ptomaines or amines that may disturb the intricate balance of the autonomic nervous system; or may act directly upon smooth muscle of arteries or glands, or may alter capillary permeability and bring about changes in the electrolyte and colloidal equilibrium. The slow and insidious manner in which some of these effects may occur in the presence of chronic deficiency states makes a critical analysis of the symptoms, in terms of pancreatic, hepatic or renal damage, extremely difficult; such an analysis does not often indicate the basic causative factors.

Much of the current knowledge of pancreatic function is derived by analagous reasoning from animal experimentation. Investigations on the effect of ligation of the pancreatic duct in the rat have been in progress at the Medical College of Virginia during the past three years and are to be reported later. Some of the observations, however, may be of special interest to the surgeon in connection with the occurrence of postoperative shock and a possible means of avoiding this complication.

Although the rat can withstand an almost unbelievable amount of operative trauma, ligation of the pancreatic ducts (even under the most favorable and carefully controlled conditions) is accompanied by a very high mortality rate.[1] Death may result within twenty-four to forty-eight hours after the operation, the animal manifesting the classic symptoms and signs of shock. Autopsies often do not reveal the cause of death. There is no hemorrhage, no evidence of infection, and no morphologic or histologic lesions to which a fatal outcome might be ascribed.

*Director of Clinical Research, A. H. Robins Company, Inc., Richmond. Read at a meeting of the Southeastern Regional Division, United States Section, International College of Surgeons, April 30, 1956.
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Since only the pancreatic digestive enzymes had been prevented from entering the duodenum, it was decided to prepare the animals for future studies by adding active pancreatin to their diets before the operation and as soon thereafter as the animal could take nourishment. The diet was selected to supply all nutritive elements and to maintain the animals in a healthy condition. This simple measure resulted in a significant reduction in the operative mortality rate and seemed to provide effective replacement therapy, as was indicated by the normal physiologic responses and the behavior of the animals over a postoperative period of several months. Deprivation of pancreatin during this period of observation did not give rise to acute symptoms of shock but only to those which would result from a general metabolic disturbance, as indicated by growth curves and by signs and symptoms of amino acid or vitamin deprivation or endocrine deficiency.

There seems to be a close similarity between these observations on animals with their pancreatic ducts ligated and those made by Healey, Knight and Sullivan on a series of 42 cases of fatal pancreatitis from the St. Louis University Medical Service[2] not only with regard to the fulminating character of the disturbance but in the associated disorientation and psychosis these authors observed and emphasized as having diagnostic importance. Ordinarily the white rat is quite a docile creature, but when deprived of the pancreatic secretions it becomes belligerent and vicious. When pancreatin is added to the diet, the rat returns to a normal behavior pattern. Appetite is greatly increased, and the animal ingests more food and shows a corresponding increase in fecal weight. In the study mentioned, steatorrhea was not a prominent feature.

The pancreas is highly susceptible to damage from a variety of apparently unrelated factors. Dietary inadequacy with respect to total protein, particularly the nucleoprotein components; deficiency in certain essential amino acids; emotional stress and strain, which may seriously interfere with enzyme secretion; blockage of the ducts from infection; concretions and traumatic edema — all may cause severe damage to the acinar cells. Because of the fact that *trypsin* and *chymotrypsin* are necessary to prepare the dietary protein for absorption and assimilation, marked deficiencies of these enzymes create a vicious cycle, since the essential amino acids, trace elements, vitamins and intrinsic factors are not supplied to the tissues and organs of the body; and, consequently, the cells are unable to repair the damage and to restore normal physiologic activity. It seems important to bear in mind that the liver and the pancreas are functionally interdependent in controlling many aspects of metabolism. Consequently, acute disorders of these organs generally become chronic and often unamenable to correction by the usual methods of treatment, unless the function of the acinar cells can be quickly restored.

Less than a generation ago the principal cause of death was bacterial infection, with diseases of the respiratory tract, such as tuberculosis and pneumonia, occupying the leading positions. With the advent of sulfonamides, antibiotics and antimetabolites, however, this picture has changed completely. Today it is cancer and cardiovascular disease that take the greatest toll of human life. One is confronted also with the rising tide of the diseases which predominate during middle life and later and yet are not the inevitable consequences of senescence. There are the various degenerative disorders, which present a variety of syndromes but have in common certain changes in the plasma protein and lipid patterns; in the level of serum phosphatase; [illegible]osis and fatty

infiltration of the liver; in changes of the arterial wall, with formation of mucoprotein and subsequent cholesterol deposition; in many types of lesions involving the central nervous system and the joints, and in renal and biliary calculi, not to mention the many forms of cutaneous disease. Most of these conditions can be simulated in the laboratory by deprivation of amino acids or certain vitamins or certain products derived from nucleoproteins, or by the use of a drug that interferes with the metabolic function of tissue enzymes. When these diseases are produced by dietary deprivation, the changes are easily reversed by adding the special agents or factors to the animal's diet. If, on the other hand, certain enzymes of the pancreas are inhibited, the resulting disorder is usually permanent. Although clinical proof may be lacking, there is a strong and increasing conviction that a deficiency in pancreatic exocrine function may be largely responsible for many of these chronic degenerative disorders.

The ability to respond to changes of diet seems to be a property to which acinar cells are physiologically adapted. There is apparently little trypsin in the pancreatic secretions of the newborn child; the broad-spectrum proteolytic activity is acquired gradually, as new foods are added to the diet. This process is analogous to the familiar antibody/antigen relation in immunizable diseases. Milk proteins are easily tolerated and probably require little preliminary digestion because they have not been processed or altered, and the mammary glands may even furnish the necessary enzymes, which conceivably would be the same as the intercellular proteases that synthesize milk proteins from amino acids. Protein from other sources, however, would be completely foreign to the child's digestive facilities and might require special preparation to be properly assimilated.

The broad and almost unfurrowed field of human nutrition is not and should not be the restricted prerogative of any specialty. The success of an operation from the patient's point of view may rest as much upon his nutritional status as upon the skill of the surgeon or the anesthetist. There are many references in the literature to postoperative death within twenty-four to forty-eight hours, without any apparent cause except shock, which leaves no telltale marks. In a very high percentage of these cases, death follows exploratory laparotomy within the region of the celiac artery or its branches, the celiac nerve plexuses and the pancreatic ducts. Theoretically it seems possible that spasm of these arteries or edematous occlusion of the ducts could prove rapidly fatal by interfering with the detoxifying mechanism of the liver and allowing toxic amines from bacterial putrefaction to pass unchanged into the general circulation. As long as the liver is properly supplied with l-methionine, tryptophane and other essential amino acids, detoxification of the putrefactive amines is complete within the time taken by a single passage of the portal blood. In this respect there is much evidence to support the growing impression that a high protein diet is detrimental to patients with functional impairment of either the liver or the pancreas. In the experimental animal, this may be fatal.

According to the work of Luckey and his associates,[3] diets that regularly produce fatal hepatic necrosis in rats fail to do so when the intestinal tract has been made free of bacteria by the use of antibiotics. This would seem to argue for the preoperative administration of antibiotics, not necessarily for the purpose of destroying possible pathogens but as a means of protecting the liver against such putrefactive amines as shock-producing histamine. The studies of Beveridge and others[4] also

indicate that infectious hepatitis is made worse by a high protein diet. It is, moreover, a familiar observation that the geriatric patient almost instinctively avoids a high protein diet because it seems to aggravate his symptoms. These are but a few of the many studies which would seem to link surgery and nutrition.

From the surgeon's point of view, two observations seem decidedly important:

1. The pancreas is critically susceptible to damage by trauma in the region of the celiac axis and the consequent sudden suppression of enzyme production.

2. Patients about to be admitted to the hospital for surgical treatment, or even for special medical treatment, are in a state of apprehension and anxiety.

As Selye[5] has shown, the pancreas is adversely affected by emotional stress and strain, which indicates that this organ is under humoral control of the pituitary body, which in turn is affected by impulses arising in the special sensory areas of the cerebral cortex. This is the actual physiologic basis of psychosomatic medicine.

As has been stated, the production of deficiency diseases in the laboratory animal by dietary deprivation can usually be corrected by adding the missing items to the diet. In clinical practice, on the other hand, a similar syndrome is not often traceable to a deficiency in the diet; rather, it is due to faulty metabolism, either in the digestive tract or in the various cells of the body. So interdependent are the functions of the numerous cells that comprise this great symbiosis, and so delicately balanced are the enzyme systems that control all vital activities, that the search for some single etiologic factor seems hopeless. Even though all tests indicate that the patient is hypoproteinemic, a high protein diet not only fails to correct this disorder but may add significantly to the liver's burden of detoxification if the digestive enzymes are absent or markedly deficient.

Beginning at the age of 40 there seems to be a progressive decrease in proteolytic digestive enzymes, as was reported by Meyer, Spier and Neuwelt at the Michael Reese Hospital several years ago.[6] Artificial protein hydrolysates cannot compensate for normal tryptic digestion, because the amino acids are racemized and certain essential ones are not formed. Even more important is the fact that these mixtures of amino acids are not given in accordance with the needs of the various cells, and an excess of one of them may greatly increase the need for another. Synthesis of tissue proteins and other compounds can take place only to the point at which that ingredient is taken up which is present in the smallest quantity at some particular moment. It follows, therefore, that the order in which the various amino acids must be available is the reverse of that in which they are broken down in the intestinal tract by the proteolytic enzymes. Giving all of them simultaneously, therefore, does not fulfill this condition.

To supply the daily minimum requirement of the essential levo amino acids as a mixture, if these were purchased from some biologic supply house, would cost the patient approximately $30 per day. If one merely substituted the patient's stomach, so to speak, for the laboratory flask or beaker and the constant temperature bath, an adequate protein intake given along with enzymatically active pancreatin would release all the nutritive factors in an orderly, timed sequence, for optimum utilization, at a cost of less than 30 cents per day.

It seems physiologically sound, therefore, to take into consideration the nutritional state of the surgical patient and to provide not only a balanced protein diet but the means of digesting it. Supplemental vitamin therapy is helpful in reducing

the morbidity rate and the duration of convalescence, as was demonstrated in the reports of Hayes of Yale.[7] Diet alone cannot be relied upon, however, to supply the essential vitamins, because these factors are held in protein combination, and unless the protein is hydrolyzed they are not available for tissue utilization. The use of pancreatin should be routine in all cases of suspected damage to the liver or the pancreas, and as a means of preparing the patient for emergency conditions that might conceivably result in pancreatic inhibition.

The nutritional status of the patient is the most important factor in the determination of operability, particularly if the patient is elderly.[8]

SUMMARY

Evidence is presented that seems to implicate a pancreatic exocrine dysfunction as one of the principal and basic etiologic factors in postoperative fatal shock of undetermined origin, and emphasis is placed upon the extreme susceptibility of the pancreas to trauma in the region of the celiac arteries and nerves.

The administration of pancreatic enzymes and assimilable B-complex vitamins, given concurrently with an adequate protein diet, is suggested as a means of reducing surgical complications and compensating for the pancreatic insufficiency that may occur during periods of anxiety and apprehension or as a result of emotional stress and strain. This regimen would seem especially desirable for the surgical geriatric patient, both as a preoperative measure and during convalescence.

In all cases in which there may be hepatic or pancreatic damage or when the supply of amino acids to the liver is impaired, it would seem essential to suppress the bacterial flora by antibiotics as a means of preventing toxemia and postoperative shock.

RÉSUMÉ

Les faits exposés semblent indiquer qu'une dysfonction pancréatique exocrine est un des facteurs étiologiques les plus importants du choc post-opératoire fatal d'origine indéterminée. L'auteur insiste sur l'extrême sensibilité du pancréas aux traumatismes qui se produisent au niveau des artères et des nerfs coeliaques.

L'administration d'enzymes pancréatiques et de complexe vitaminique B avec un régime protéinique est suggérée en vue de diminuer les complications chirurgicales et de compenser l'insuffisance pancréatique pouvant se produire durant une période d'anxiété et d'appréhension ou à la suite d'une tension ou d'une fatique nerveuses. Ce régime semble particulièrement indiqué dans les cas de chirurgie chez les vieillards, à la période pré- et post-opératoire.

Dans tous les cas d'affections hépatiques ou pancréatiques, ou lors d'un apport insuffisant d'acides aminés, il semble essentiel de supprimer la flore bactérienne au moyen d'antibiotiques afin de prévenir la toxémie et le choc opératoire.

RESUMEN

Se presenta la posibilidad, basada en evidencias, de que uno de los principales factores etiológicos del choque postoperatorio fatal, de origen desconocido, lo constituye una disfunción exócrina del páncreas. Se señala la gran susceptibilidad del páncreas a los traumas de la región de las arterias y nervios celíacos.

La administración de enzimas pancreáticas y vitaminas asimilables del complejo B, junto con una dieta proteica, parece ser un medio para disminuir las complicaciónes quirúrgicas y compensar la insuficiencia pancreática que puede ocurrir durante los períodos de ansiedad como resultado de tensión emocional y agotamiento. Este régimen parece muy

recomendable para el paciente geriátrico quirúrgico, tanto como medida preopera toria como postoperatoria

En todos los casos en que pueda haber una lesion hepatica o pancreatica, o cuando se encuentre entorpecida la aportacion de amino acidos al higado, parece ser esencial el suprimir la flora bacteriana por medio de antibioticos, con el objeto de evitar la toxemia y el choque postoperatorio

RIASSUNTO

Vengono portati degli elementi in favore dell'ipotesi che una disfunzione esocrina del pancreas possa essere responsabile di shock mortali post-operatori di origine sconosciuta Il pancreas e estremente suscettibile ad ogni trauma nella regione delle arterie e dei nervi celiaci

Si propone di somministrare enzimi pancreatici e vitamine del complesso B, assieme ad unadieta proteica, come mezzo per ridurre le complicazioni chirurgiche e compensare l'insufficienza pancreatica che si crea in seguito a lunghi periodi di ansieta o depressione o in seguito a traumi emotivi

Questo regime sembra sopratutto utile nei pazienti chirurgici avanti negli anni, cosi preoperatoriamente come anche durante la convalescenza

In tutti i casi in cui si sospetta un danno pancreatico od epatico, o quando vi sia insufficiente apporto di aminoacidi al fegato, e necessario sopprimere la flora batterica mediante antibiotici per prevenire la tossiemia e lo shock postoperatori

SUMARIO

O auter apresenta evidencia de que a desfunção pancreatica parece ser um dos fatores etiológicos basicos no choque pos operatorio fatal de origem indeterminada e saliento a extrema susceptibilidade do pâncreas ao trauma, na regiao das arterias e nervos celiacos

Sugere a administração de ênzimas pancreaticos e vitaminas assimilaveis do complexo B, dados correntemente com dieta de proteina, como meio de reduzir complicações cirurgicas e compensar a insuficiência pancreatica, que pode occorrer durante periodos de ansiedade e apresnsão ou como resultado de tensão emocional Esse regime pareceria especialmente desejavel para o paciente geriatrico cirurgico, tanto como medida preoperatoria come durante a convalescença

Em todos os casos em que possa haver lesão hepatica ou pancreatica ou quando o suprimento de amino ácido do fígado fôr lesado, pareceria essencial suprimir a flora bacteriana por antibióticos, como meio de se prevenir a toxemia e o choque pos operatorio

ZUSAMMENFASSUNG

Die in der vorliegenden Arbeit dargestellten Beobachtungen scheinen daraufhinzudeuten, dass eine Funktionsstorung der ausseren Sekretion der Bauchspeicheldruse zu den wesentlichen und grundlegenden atiologischen Faktoren des todlichen postoperativen Shocks unerklarten Ursprungs gehort Es wird mit Nachdruck auf die ungeheure Empfindlichkeit der Bauchspeicheldruse gegenuber Verletzungen in der Gegend der Schlagadern und Nerven des Bauches hingewiesen

Die Verabreichung von Pankreasenzymen und assimilierbaren B-Vitamin-gruppen in Verbindung mit einer Eiweissdiat wird als Mittel zur Herabsetzung chirurgischer Komplikationen und zur Ausgleichung einer Pankreasinsuffizienz empfohlen, die wahrend Perioden von Angstzustanden oder als Folge seelischer Überbelastung eintreten kann Eine solche Diat scheint besonders fur chirurgische Patienten vorgeruckten Alters sowohl als Vorbereitung zur Operation als auch wahrend der Rekonvaleszenz wunschenswert zu sein

In allen Fällen von Leder-oder Pankreasschädigung oder bei unzureichender Versorgung der Leber mit Aminosäuren scheint zur Verhütung von Blutvergiftung und Operationsschock die Unterdrückung der Bakterienflora durch Antibiotika wesentlich zu sein.

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Jan. 5, 1703-4. This day about 4 in ye afternoon departed this life that excelent person Sir Thomas Willington, in ye 75th year of his age and ye 7th of his presidency of this College (of Physicians). Bred at Wesminster Schoole, afterwards Fellow of All Souls' College in Oxford, and ye great ornament of both. Sidleian Professor of Natural Philosophy in Ye University; and whilst he discovered to his auditors, in his admirable lectures from Yt chair, ye more secret methods of nature, he together with Bp. Wilkins, Mr. Boyle, Dr. Wallis, Sir Christopher Wren, Dr. Willis, an other indgenious persons there laid the first foundations of ye Royal Society. Admitted afterwards into ye College of Physicians, London, he soon became ye delight of it, affable in his conversation, firm in his friendships, diligent and happy in his practice, candid and open in consultations, eloquent to an extraordinary degree in his publick speeches; being chosen President, his behaviour was grave, temper'd with courtesy, steady without obstinacy, continually intent upon ye good of ye College, wch by his prudent conduct he redeemed from ye greatest part of a very heavy debt . . . . Some five years before his death he was cut for stone in ye bladder, wch operation and ye whole course of ye cure he bore with admirable piety and exemplary courage. At length worn out with little but often recurring fevers, and a nervous asthma, he piously and quietly paid his last debt to nature. Thus died this great person, but ye memory of his virtues never can.

(Annals of the College of Physicians, London).

Pseudopancreatic Cysts

S. K. SEN, M.D., F.R.C.S., F.I.C.S.

NEW DELHI, INDIA

PANCREATIC cysts are rare. Although there is now an extensive literature on the subject, most of it is a record of individual experiences with small series of cases. This communication is based on 9 cases of pseudopancreatic cysts treated by me by anastomosis with some portion of the gastrointestinal tract.

Jordan Lloyd first differentiated the pseudopancreatic from the true cyst (1892). Körte (1898) defined it as a collection of fluid in the neighborhood of the pancreas but not connected with it. This erroneous definition is responsible for the classification in the literature. Two examples are (1) the retroperitoneal cyst lying adjacent to the pseudopancreatic cyst and (2) the mesenteric cyst lying in relation to the pancreas. Second, a collection of fluid in the substance of the pancreas is undoubtedly a variety of pseudopancreatic cyst, yet it would not be covered by Körte's classification. Jordan Lloyd defined a pseudocyst as a collection of fluid produced by extravasation of pancreatic juice and its coming into contact with the surrounding tissues. A collection of blood or serum in the adjacent tissues or in the substance of the pancreas itself, if it had no pancreatic ferment acting on it, would not constitute a pseudopancreatic cyst. Jordan Lloyd recognized the fact that trauma produces a pseudocyst, and Körte noted a history of trauma in 33 of 117 recorded cases.

Trauma is not, however, the only cause of pseudopancreatic cysts. Acute or subacute pancreatitis is another important cause. It is easy to understand the formation of a pseudopancreatic cyst after acute or recurrent bouts of pancreatitis. There is extravasation of the ferments of the pancreas, and the stage is set for the production of the cyst. The formation of a pseudopancreatic cyst in cases of chronic pancreatitis is difficult to understand. Probably the fibrosis of the gland constricts the ducts and gives rise to retention cysts. Pancreatic ferments exuded through the walls of these retention cyts would cause an effusion of fluid constituting a pseudopancreatic cyst. Mahorner and Mattson (1931) considered at length both the etiologic factors and the pathologic picture. In this communication, however, these will not be discussed in detail; I am mainly concerned here with cysts that have occurred after trauma, acute pancreatitis or an operation on the gallbladder.

Thus far I have not encountered a case of true cyst of the pancreas. This lesion must be extremely rare. Only 1 patient in my experience, with a mass in the upper part of the abdomen, was observed on exploration to have an inoperable, partly cystic and partly solid growth arising from the pancreas. The biopsy report referred to it as an adenocarcinoma, but this might have been a case of true pancreatic cyst in which malignancy had developed.

The diagnosis of a pancreatic cyst is essentially roentgenographic. A history of frequent attacks of pain or of injury may be available. A mass in the upper part of the abdomen, when examined roentgenographically, usually yields a picture that clinches the diagnosis.

Anatomic Considerations.—Judd, Mattson and Mahorner have described three

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locations occupied by a pseudopancreatic cyst:

1. Presenting between the stomach and the transverse portion of the colon, behind the gastrocolic ligament.
2. Protruding into the lesser sac and presenting between the stomach and the liver.
3. Lying between the layers of the colon, either behind the transverse colon or below it.

Rarely do these cysts protrude behind the descending colon or descend down to the pelvis.

Treatment. — Without doubt the only recognized treatment of pancreatic cysts is operation. The evolution of the different methods of treatment, however, is an interesting study. Three methods are recognized. The ideal is excision, but in the majority of cases excision is not a physical possibility. In the series here presented, all of the patients were treated by anastomosis with some portion of the gastrointestinal tract. The third method, marsupialization, is now rapidly going out of favor. Prior to this series I had been practicing marsupialization. Invariably all of the cases traced up to four or five months after the operation were miserable with discharging sinuses. In 1 case reported by Kerr the sinus drained for fifteen years. The main objections to this form of therapy are (a) autodigestion of the abdominal wall, (b) infection of the cyst and sinus, (c) severe inanition, (d) repeated hemorrhage and (e) a persistent sinus. All methods of closing the sinus prove inefficacious.

In spite of all the aforementioned objections, external drainage is still regarded by many surgeons as the safest procedure, because of its simplicity and low mortality rate (Zaaussis). Total extirpation is attended with risk of severe hemorrhage; indeed, pseudopancreatic cysts cannot be excised (Milroy Paul). Cysts that cannot be excised are best drained internally. Kerr did the first anastomosis of such a cyst to the gallbladder, then anastomosed the gallbladder to the stomach. Anastomosis with some part of the alimentary canal was based upon an effort to cure a persistent fistula. This fistula was first transplanted into a hollow viscus; the next advance was a one-stage anastomosis. Rudolf Jedileka (1922) reported a case in which the infundibulum of the cyst was anastomosed to the stomach and supplemented by external drainage. This operation is a landmark in the history of the treatment of pancreatic cyst. Most pancreatic cysts, however, do not have an infundibulum; the technical details of Jedileka's operation, therefore, cannot be applied in most cases. Jurasz in 1931 made a large opening through the posterior gastric wall into the pancreatic cyst. Jurasz did not use sutures to stitch the cyst to the stomach, so firm were the adhesions of the stomach to the cyst.

This point of Jurasz is not appreciated by all workers. Bickford (1948) described a case in which the adhesions between the stomach and the pseudocyst were so dense that he could not separate them. Hence an anastomosis was abandoned and external drainage was established, the fistula taking seventy-nine days to heal. The conditions were, on the contrary, ideal for an anastomosis with the stomach, with no necessity to suture the cut margins.

Jurasz' technic was modified in my series by anastomosing the cyst with whatever part of the gastrointestinal tract that is nearest and most adherent to the cyst. In 4 cases I have established transgastric drainage in the upper half of the stomach, in the posterior stomach wall. In 1 case I anastomosed the cyst with the antrum and in 2 cases with the jejunum; in 2 other cases it was dealt with by a transduodenal

approach. In no case except the 2 involving the jejunum did the necessity arise of employing sutures for the anastomosis. The anastomosis with the antrum was a standard two-layer anastomosis.

Some surgeons have objected to the anastomosis of the pseudopancreatic cyst with the gastrointestinal tract, on the assumption that the intestinal contents will leak into the cyst and produce suppuration. For this a Roux en Y anastomosis to the jejunum has been devised by Rosi (1951). I have had no occasion to use such a technic. Our radiologists, however, have repeatedly failed to push barium into the cyst postoperatively through the anastomosis except in 1 case, in which the barium examination was done within ten days of the anastomosis, and that too in the antrum. I have encountered no complications due to leakage of contents of the gastrointestinal tract into the cyst.

REPORT OF CASES

CASE 1.—A woman aged 42 was observed in June 1952, with a mass in the right upper abdominal quadrant and frequent attacks of pain in the cyst. There was no history of disease of the gallbladder, nor was there a history of injury. The roentgen diagnosis confirmed my suspicion that a pancreatic cyst was present. A laparotomy was performed. Through an inadvertency the cyst, while being handled after determination of its origin in the right side of the body of the pancreas, burst and discharged a large quantity of hemorrhagic fluid. The pressure of the fluid was so great and the contents of such a color that for a moment the impression was that of having burst into an aneurysm. It soon became clear, however, that the lesion was a pseudopancreatic cyst. A large portion of the cyst was excised, and the remainder was anastomosed with the antrum against which it was lying. The patient made an uneventful recovery.

The biopsy report confirmed the diagnosis of pseudopancreatic cyst.

CASE 2.—A Sikh boy aged 17 was hit by a tonga shaft in the upper part of the abdomen in February 1952. He was admitted to my ward vomiting blood and *in extremis*. He recovered after conservative treatment and was discharged twenty-one days after the injury as completely cured. He returned in July 1952 with a mass in the upper left quadrant of the abdomen and complaining of severe pain therein. Clinically the mass was the size of a large grapefruit, seemed cystic on palpation and appeared to be pulsating. Auscultation, however, failed to reveal any bruit. A tentative diagnosis of pancreatic cyst was made, and roentgen examination confirmed it.

On exploration the cyst was observed to arise from the pancreas and was situated behind the stomach. A large transgastric drain was established in the posterior wall of the stomach. It was not necessary to stitch the stomach wall to the cyst, as the adhesions were extremely firm.

CASE 3.—A Sikh from Jullunder aged 37 (male) was operated on by me for acute disease of the abdomen in 1949. When the abdomen was opened, hemorrhagic fluid in the peritoneum and necrosis of the fat confirmed the diagnosis of acute pancreatitis. The abdomen was closed. The postoperative period was stormy, and the patient was discharged from the hospital sixty-two days after the operation.

He returned in 1953 with a mass in the upper part of the abdomen. Roentgen examination proved the presence of a pseudopancreatic cyst, and a posterior gastrocystostomy was easily accomplished. Recovery was uneventful.

CASE 4.—K. K., a man aged 21, was operated on by me in 1950 on the basis of a mistaken diagnosis of intestinal obstruction. At operation, hemorrhagic pancreatitis was obvious and the abdomen was closed. The patient had an uneventful recovery but returned two years later with another attack of acute abdominal disease. This time the value for serum amylase was 485 mg. (dextrose equivalent of 100 cc.). Aspirated fluid from the peritoneal cavity was hemorrhagic and very high in amylase content. The urine showed all the acetone bodies in large quantities and the value for blood sugar was 380 mg. per hundred cubic centimeters. The patient was treated by conservative means and recovered after a stormy period of three weeks. The value for amylase dropped, but those for blood sugar and urine sugar remained high. The patient was sent to a physician for further treatment. He returned to me after fourteen months mass in the upper part of the a free of sugar and acetone bodies in t

Pseudopancreatic Cysts

Data on Patients in Author's Series

Case		*Biliary Tract History*			*History of Previous Operation*	*History of Injury*	*Observations at Operation*		*Biopsy*
No.	*Age Sex*	*Cholecystitis*	*Gallstones*	*Jaundice*			*Biliary Tract*	*Anastomosis*	
1	42 H.F.	Nil	Nil	Nil	Nil	Nil	Normal	Antrum	Pseudocyst
2	17 H.M.	Nil	Nil	Nil	Nil	Yes	Normal	Posterior wall of stomach	-do-
3	37 H.M.	Nil	Nil	Nil	Laparotomy	Nil	Normal	Posterior wall of stomach	-do-
4	21 H.M.	Nil	Nil	Nil	Laparotomy	Nil	Normal	Jejunum	-do-
5	53 H.M.	Yes	Yes	Yes	Cholecystectomy & choledochostomy	Nil	Cured	Jejunum	-do-
6	? M.M.	Nil	Nil	Nil	Nil	Nil	Normal	Transduodenal	Not done
7	49 Ch.F.	Yes	Nil	Yes	Cholecystectomy	Nil	Stone in C.B.D.	Transduodenal	Cyst with fibrous wall
8	55 M.F.	Nil	Nil	Nil	Marsupialised cyst	Nil	?	Posterior wall of stomach	Not done
9	51 H.M.	Acute	Nil	Nil	Cholecystectomy	Nil	?	Posterior wall of stomach	Pseudocyst

After diagnosis he was operated on with the idea of doing a gastrocystectomy, as clinically and roentgenographically the stomach was in front of the cyst At operation the adhesions caused by the previous operation and the two attacks of pancreatitis precluded easy access to the stomach, and an anastomosis with the jejunum was easily performed The patient recovered uneventfully

CASE 5 —P B , a male Hindu aged 53, was admitted to the hospital with a gallstone causing obstruction Exploratory laparotomy was performed and the ileus relieved Six months later the gallbladder was removed, and the common bile duct was observed to contain two stones, which were removed and drainage with a T tube established Cholangiographic investigation was done ten days after the second operation, with normal results Soon afterward acute pain developed in the abdomen, and acute pancreatitis was suspected The serum amylase level was not high The patient was severely ill for three or four weeks but slowly recovered He returned after nine months with a mass in the middle of the upper part of the abdomen Once again, since it was obvious that anastomosis of the cyst with the jejunum was the easiest procedure, this was performed The patient made an uneventful recovery

CASE 6 —B R , a young male Muslim, presented himself to me with a mass in the right upper abdominal quadrant There was no history of pain, fever or injury The mass was investigated and was reported by the roentgenologist to be a pancreatic tumor greatly widening the duodenal loop At exploration it was not possible to make sure from which part of the pancreas the tumor arose Because of its proximity and adhesion to the duodenum, a transduodenal connection with the cyst was judged easiest and was established

CASE 7 —A European woman aged 49, who had undergone cholecystectomy two years earlier in her own country, had a small mass in the upper part of the abdomen, together with mild jaundice A diagnosis of cancer of the head of the pancreas was made She insisted on an operation, and in January 1954 an exploration was done with the idea of performing a radical pancreatectomy A cyst was located in the inferior border of the pancreas, and the common duct was full of stones Anastomosis of the cyst with the duodenum was performed The stones were removed from the common duct, which was drained by a T tube The pathologic diagnosis was "cyst with fibrous wall" No evidence of malignancy was observed

CASE 8 —A Muslim woman aged 55 had undergone marsupialization for a cyst of the pancreas ten years earlier in a Bombay hospital The cyst had recurred and was diagnosed as a pseudopancreatic cyst An exploratory laparotomy was performed, and, contrary to expectation, it was a simple matter to establish a transgastric cystogastrectomy

CASE 9 —P B , a man aged 51, was operated on by me for acute cholecystitis in April 1955 He had a stormy postoperative period, and a large mass developed in the abdomen As the patient was very ill, he refused further investigations or treatment and left against medical advice He reported again in October 1955 All these months he had been severely ill and was undergoing all types of treatment without benefit Aspiration was done a few times, and clear fluid was removed Roentgenographically a pseudopancreatic cyst was diagnosed Examination of the aspirated fluid gave no definite indication of the nature of the cystic fluid content

Operation was performed, and a transgastric anastomosis was easily established between the posterior wall of the stomach and the cyst

SUMMARY

The ideal treatment for pseudocysts is total extirpation, but because of technical reasons it is hardly ever possible to undertake such a procedure The recognized practical treatment of pseudopancreatic cysts in the past has been marsupialization, which has been by no means satisfactory Until recently I also practiced marsupialization In 1931 Jurasz established anastomosis between the cyst and the gastric wall Since then many workers have published reports on individual cases I began performing internal anastomosis in 1952, since which time I have treated 9 patients Reports of these 9 cases are presented No originality is claimed for the method of treatment employed

RESUMEN

El tratamiento ideal para el pseudoquiste es la extirpacion, sin embargo, razones técnicas hacen casi imposible dicho

procedimiento. En la pasado el tratamiento prácticamente reconocido fué la marsupialización, que no ha mostrado ser satisfactoria. En 1931 Jurasz preconizó la anastomosis entre el quiste y el pared del estómago. Desde entonces muchos autores han publicado casos individuales. Yo empece a hacer la anastomosis interna desde 1952; desde ese año he tratado 9 pacientes. Se comunican los 9 casos. El método terapeútico no es original.

RÉSUMÉ

Le traitement idéal des pseudokystes du pancréas est l'extirpation totale, mais elle n'est techniquement pour ainsi dire jamais pratiquable. Autrefois le traitment de choix des pseudokystes pancréatiques était la marsuplialisation; les résultats n'en étaient pas satisfaisants. C'est la méthode qu'utilisait récemment encore l'auteur. En 1931 Jurasz établit une anastomose entre le kyste et la paroi gastrique. Depuis cette date plusieurs cas individuels ont été publiés. L'auteur adopta l'anastomose interne dès 1952; il a traité depuis lors 9 cas rapportés ici.

RIASSUNTO

Il metodo ideale di cura delle pseudocisti è l'asportazione totale, ma molto spesso questa non è possibile per ragioni tecniche. In passato la cura di elezione delle pseudocisti del pancreas era rappresentata dalla marsupializzazione, che tuttavia non è un metodo soddisfacente; l'autore stesso la ha praticatafino a poco tempo addietro. Nel 1931 Jurasz propose l'anastomosi fra la parete cistica e lo stomaco, e da allora molti casi sono stati pubblicati. L'autore ha cominciato nel 1951 a fare delle anastomosi interne e da allora ha trattato 9 pazienti senza portare modificazioni al metodo originale.

ZUSAMMENFASSUNG

Die ideale Behandlung von Pseudozysten besteht in der totalen Extirpation, deren Ausführung jedoch aus technischen Gründen kaum jemals möglich ist. Die bisher anerkannte praktische Behandlung von Pseudozysten der Bauchspeicheldrüse ist die Zysteneinnähung, die auch vom Autor bis vor kurzem ausgeführt wurde, aber keineswegs befriedigend ist. Im Jahre 1931 stellte Jurasz eine Anastomose zwischen der Zyste und der Magenwand her. Seitdem haben viele Autoren einzelne *Fälle berichtet. Der Verfasser begann mit* der Anlegung interner Anastomosen im Jahre 1952 und hat seitdem neun Kranke behandelt, über die er hier berichtet. Er erhebt keinen Anspruch auf Originalität für die von ihm angewandte Behandlungsmethode.

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Honey and water is generally acknowledged to enfeeble those who drink it and for this reason, it has acquired a reputation for hastening death It got this name from people starving to death, as some actually use this mixture for such a purpose In fact it does not hasten death in all cases but is much more strengthening than water alone so long as it does not upset the stomach

—*Hippocrates*

Tubulovalvular Biliary-Jejunal Anastomosis

Personal Technic

CAETANO ZAMITTI MAMMANA, M.D., F.I.C.S.
SAO PAULO, BRAZIL

GENERALLY considered, the biliary-jejunal anastomosis, in addition to involving the complications caused by alimentary reflux and by stasis, diverts the bile to the small intestine, with functional disturbance of digestion.

The various technics that have been conceived to remove these inconveniences have not met their sponsors' expectations.

The precolic or retrocolic technic for this procedure, according to Brentano, with complementary jejunojejunostomy, has been classified as a bad operation and is now obsolete.

The technic of Monprofit, employed since 1904, has also been banned. Lately, these procedures have been changed so as to give the excluded afferent loop a greater length; in Brentano's technic the complementary laterolateral jejunojejunostomy is made 60 to 65 cm. from the biliary-jejunal anastomotic opening. It is advised that the terminal lateral anastomosis of the afferent loop be made at the same distance in the terminal process.

Perl of Chicago gives the excluded loop the length of 44 cm. (16 inches), furnishing it with conic valvular invagination. Other surgeons "preconize" the narrowing of the small extension of the jejunal cavity by plicating its walls.

In order to prevent the stenosis that appears later at the level of the anastomotic orifice, Nuboer has advised the introduction of a jejunal mucosal muff into the orifice of the biliary duct to which the loop is anastomosed.

Biliary Jejunal Anastomosis by the Tubulovalvular Process, with Exclusion of the Loop en Y and Anisoperistaltic jejunojejunostomy (Personal Technic). — The technic to be described eliminates the complications caused by reflux and stasis, as has been proved by roentgen study in the case of the patient on whom I operated in the Santa Casa de Misericordia of Sao Paulo (service of Prof. Zeferino Do Amaral). In this case I performed tubulovalvular hepatojejunostomy with exclusion of the loop en Y, and anisoperistaltic jejunojejunostomy. The anastomosis of the jejunum was made with the hepatic duct, at the point of confluence of the right and left intrahepatic ducts.

Encouraged by the immediate success obtained with this intervention, I intend to continue my studies of this matter, carrying out experiments on dogs.

In order to facilitate exposition from the technical point of view, I shall describe first the cholecystojejunostomy, showing later the other types of anastomosis between the jejunum and other portions of the principal biliary duct.

Tubulovalvular Cholecystojejunostomy with Exclusion of the Loop en Y and Anisoperistaltic Jejunojejunostomy. — This type of intervention should be used only in cases of high obstruction of the choledochus, below the implantation of the cystic duct, and when there is no possibility of performing a tubulopapillary cholecystoduodenostomy or a papillary choledochoduodenostomy.

Technic.—The technic varies according to the operation (cholecystojejunostomy, choledochojejunostomy or hepatojejunostomy). The jejunal loop is sectioned 10

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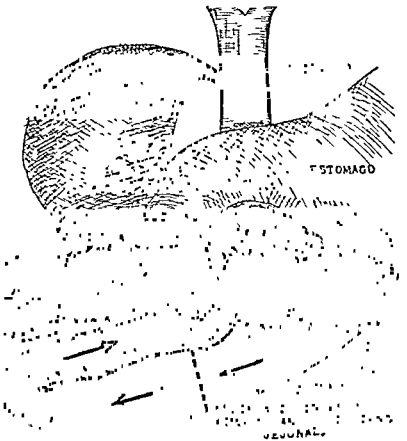

Fig. 1.—Jejunal loop sectioned 10 to 30 cm. from duodenojejunal angle.

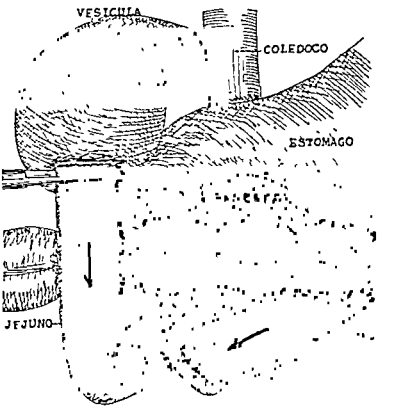

Fig. 3.—Length of the jejunal loop sufficient to permit its anastomosis with a chosen biliary duct without the use of traction upon same.

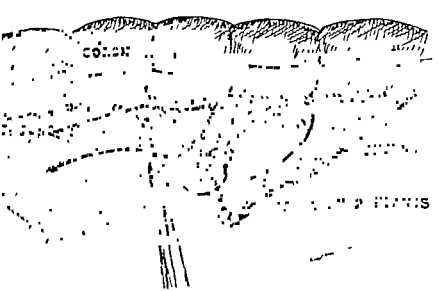

Fig. 2.—Jejunum cross-sectioned between two nippers and terminal extremity of afferent loop closed by suture in two planes.

Fig. 4.—Incision along free border of jejunum. Serosa and the circular muscular fibers are intersected. Mucosa is herniated through incision.

to 30 cm. from the duodenojejunal angle (Fig. 1). The mesentery is perforated with fine nippers and then sectioned with the scissors parallel to the border of the intestine, between this and the bordering arcade, to the extent of 1 cm. Then the bordering arcade is sectioned between two ligatures, and the incision is prolonged in the direction of the root of the mesentery.

The jejunum is cross-sectioned between two nippers, and the terminal extremity of the afferent loop is closed by a suture in two planes with No. 0 chromic catgut (Fig. 2).

The length of the efferent jejunal loop should be sufficient to permit its anastomo-

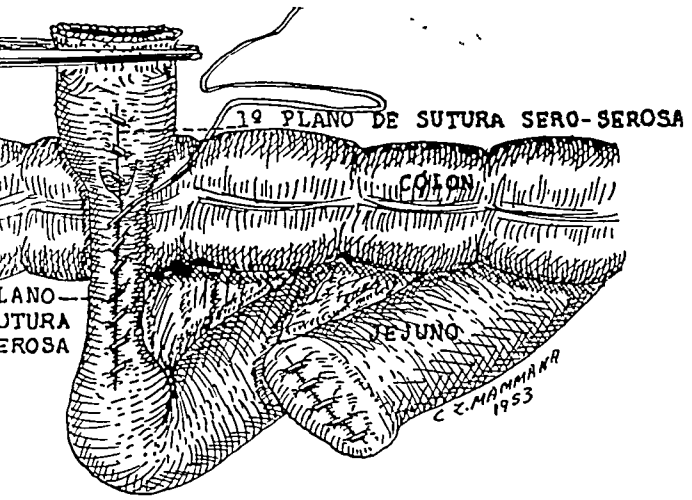

Fig. 5.—Second plan of seroserosal suture, transforming jejunal loop into long tubule.

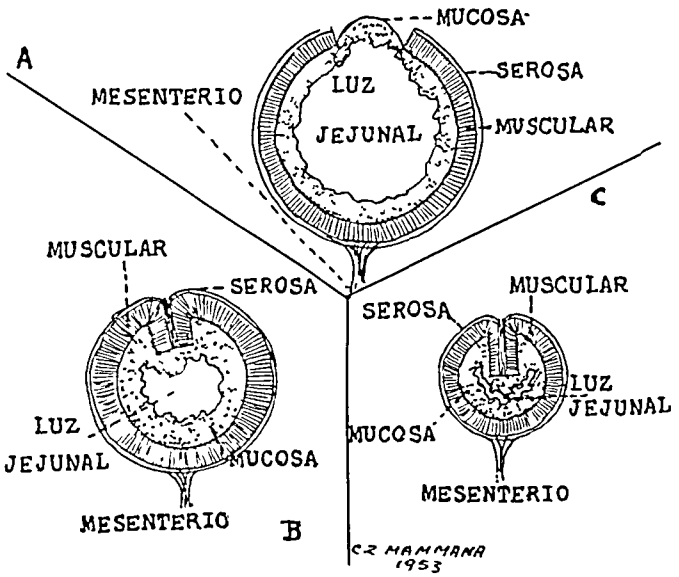

Fig. 6.—Cross sections of intestine. *A*, incision along free border, showing herniated mucosa; *B*, first plane of suture of interment; *C*, second plane of suture of interment.

sis with a chosen portion of the biliary duct without the exercise of traction upon it (Fig. 3).

In order to prevent complications that might occur in consequence of eventual hypertension of the biliary canals, these may be drained to the outside by means of a fine Nelaton probe introduced through a buttonhole made in the mucosa at the level of the middle part of the jejunal tubule, and in part buried, according to Witzel's method, by sutures in two planes as previously described.

At a distance of 4 cm. from the terminal extremity of the efferent loop, an incision 7 to 10 cm. long is made along the free border of the jejunum. The serosa and the circular muscular fibers are intersected, but the mucosa, which is herniated through the incision, is respected (Figs. 4 and 6).

A continuous seroserosal buried suture (No. 0 chromic) is made along the incision toward the jejunal walls, in order to restrict the size of the jejunal cavity (Fig. 6).

A second plane of continuous seroserosal suture with No. 0 chromic catgut transforms the jejunal loop into a tubule (Figs. 5 and 6).

An ample laterolateral jejunojejunostomy is made, with the loops placed in an antiperistaltic direction. Care must be taken to suture the terminal portion of the afferent loop along the wall of the inferior portion of the jejunal tubule (Fig. 8). The superior extremity of the anastomotic orifice must be located 5 cm. from the terminal portion of the afferent loop, which, in its turn, takes the shape of the bottom of a bag, and retards peristalsis in that region; this is already delayed at the

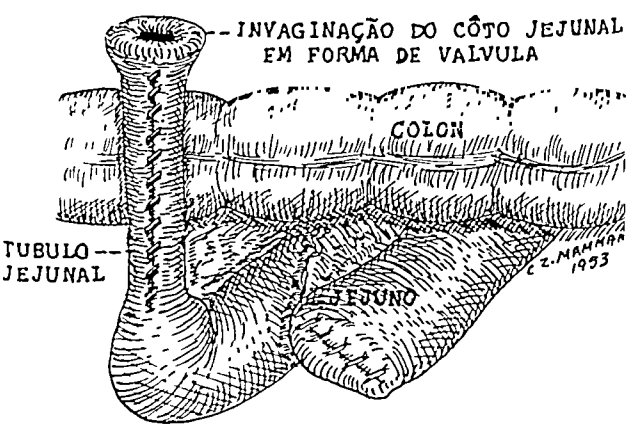

Fig. 7.—Nippers that close extremity of efferent jejunal loop are removed; wall of stump invaginated in form of valve, to distance of 0.5 cm.

level of the laterolateral anastomosis (Figs. 9, 10 and 11).

The nippers that close the extremity of the afferent jejunal loop are removed, and the wall of the stump is invaginated to the extent of 0.5 cm., in the form of a valve.

The gallbladder, punctured at its bottom, is emptied of its contents, and the puncture orifice, after being amplified, is anastomosed to the terminal extremity of the efferent loop of the jejunum (Figs. 8 and 9). The walls of the gallbladder or those of the principal biliary canal (choledochus or hepatic duct) are sutured to the serosa of the jejunum, 0.5 cm. from its mucosa. This suture must be made in two planes with nonabsorbable thread (cotton, silk or linen) in a long, fine, curved atraumatic needle. As a complementary procedure, in addition to the epiploonplasty around the anastomotic mouth, it is advis-

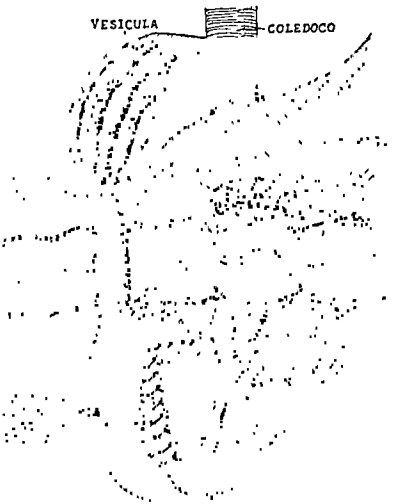

Fig. 8. — Tubulovalvular cholecystojejunostomy, with exclusion of loop *en Y* and precolic laterolateral anisoperistaltic jejunojejunostomy.

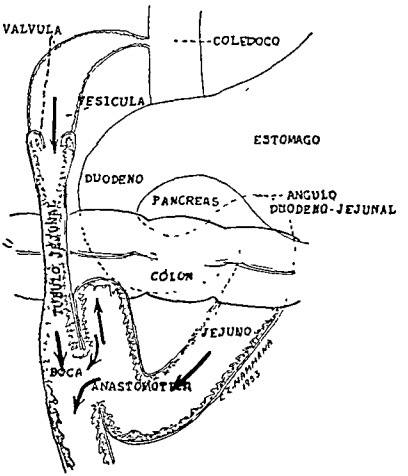

Fig. 9.—Schematic drawing of precolic cholecystojejunostomy. Extremity of anastomotic mouth was located 5 cm. from terminal portion of afferent loop, which was transformed to a "bottom of a bag," which, in its turn, was sutured along wall of inferior portion of new-formed jejunal tubule.

able to fix, by means of separate stitches, the anastomosed loop of fibrous tissues anterior to the hilus of the liver to the peritoneum of the hepatic pedicle, to the duodenal serosa and to the posterior parietal peritoneum.

Tubulovalvular Choledochojejunostomy, with Exclusion of the Loop en Y and Anisoperistaltic jejunojejunostomy.—This operation is indicated for accidental lesions or for irremovable obstruction of the choledochus above the superior border of the duodenum, when there is no possibility of implanting that duct in the duodenum or of performing papillary choledochoduodenostomy (Fig. 10).

The operative steps are identical with those of the cholecystojejunostomy aforedescribed. If the choledochus is dilated, its walls are fixed to the jejunal serosa, at a little distance from the mucosa, by means

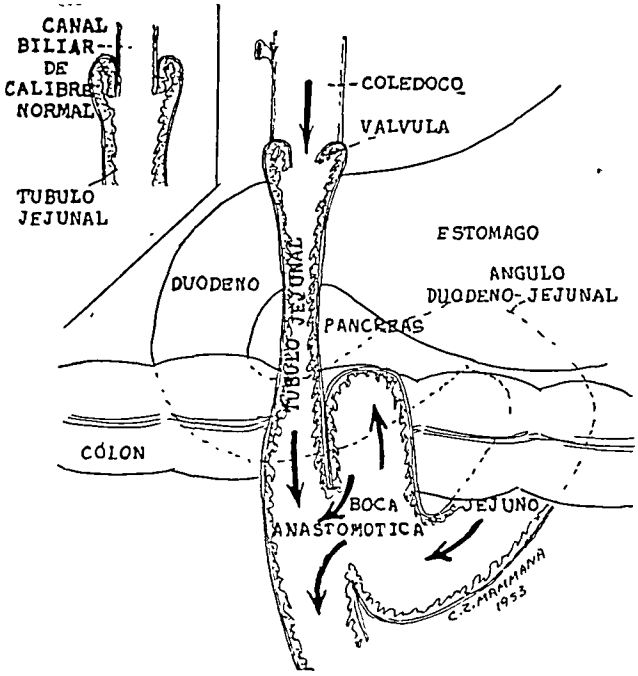

Fig. 10.—Schematic drawing of precolic choledochojejunostomy in which walls of biliary duct were dilated. At side, anastomosis of biliary canal of normal size, damaged accidentally.

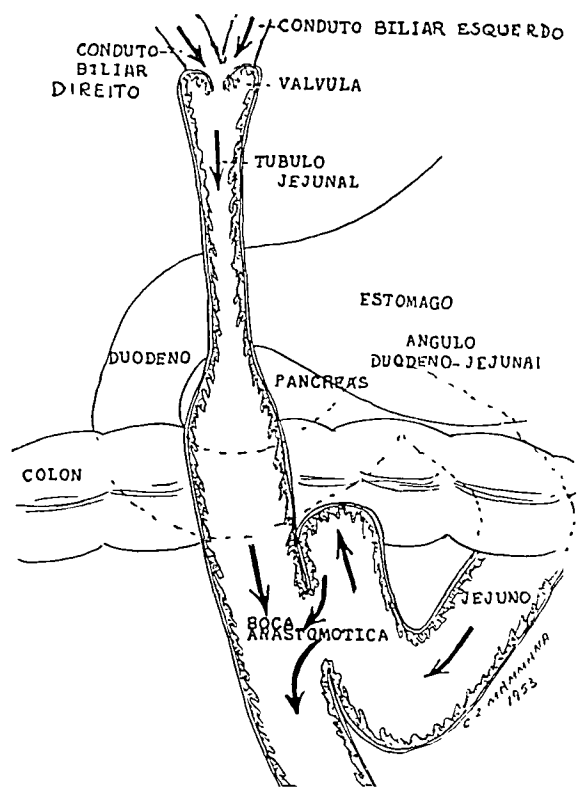

Fig. 11. — Schematic drawing of tubulovalvular hepatojejunostomy with exclusion of the loop *en Y* and anisoperistaltic jejunojejunostomy.

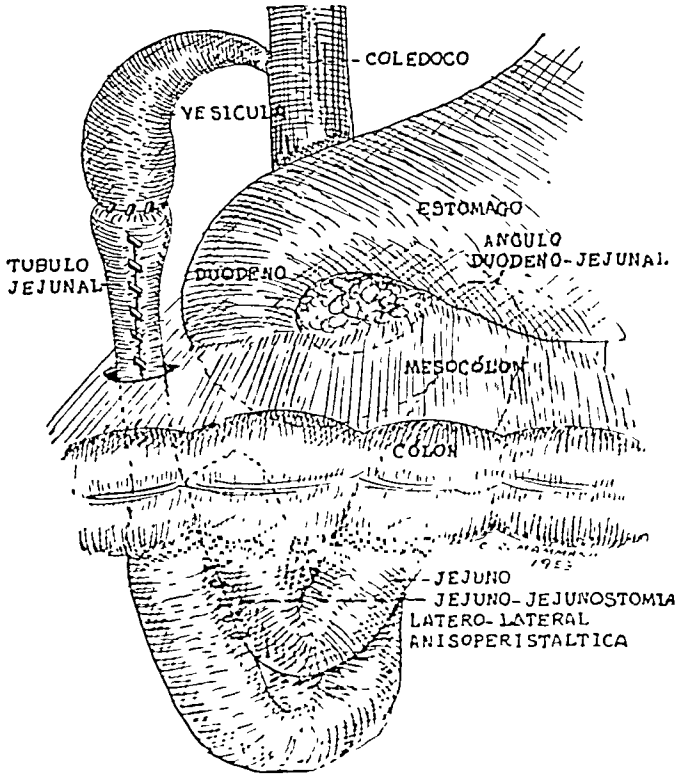

Fig. 12. — Schematic drawing of tubulovalvular cholecystojejunostomy with exclusion of loop *en Y* and retrocolic antiperistaltic jejunojejunostomy.

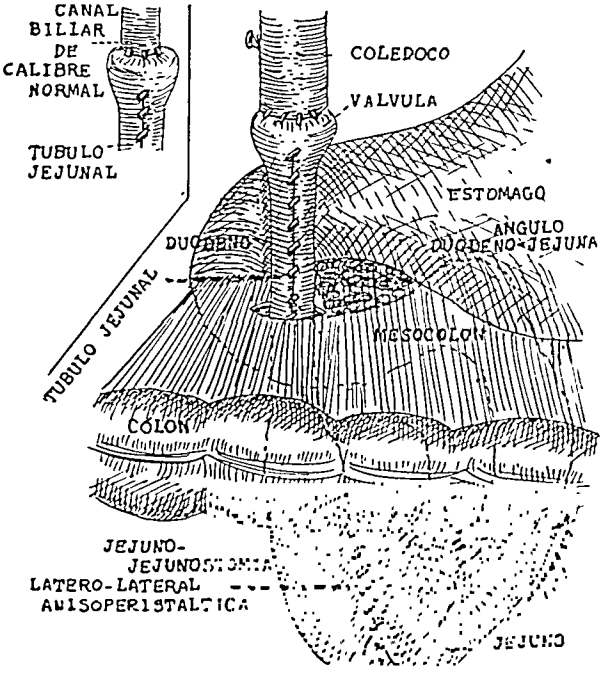

Fig. 13. — Schematic drawing of tubulovalvular choledochojejunostomy, with exclusion of loop *en Y* and retrocolic antiperistaltic jejunojejunostomy.

of a suture in two planes, the stitches including the muscular layer of the loop

In cases of accidental injury, the biliary duct of normal size is first sutured circularly to the serosa of the jejunum, near the mucosa, and then the whole is invaginated into the jejunal cavity The anastomosis is completed with a second plane of circular suturing, which fixes the external walls of the duct of the jejunal serosa (Fig 10)

Tubulovalvular Hepatojejunostomy with Exclusion of Loop en Y and Antiperistaltic Jejunojejunostomy (Fig 11) —This includes anastomoses of the jejunum with the hepatic duct or at the level of confluence of the right and left intrahepatic biliary ducts

The biliary-jejunal anastomoses aforedescribed can be divided, according to the position of the excluded efferent loop in relation to the transverse colon, into pre colic and retrocolic (Figs 12 and 13)

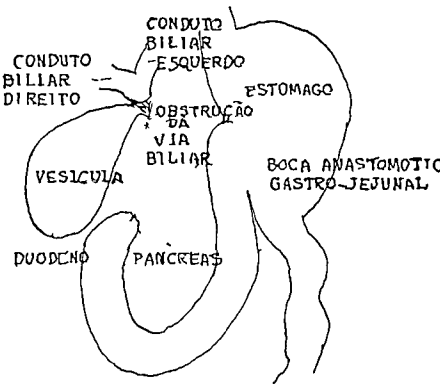

Fig 14 —Schema showing gastrectomy previously performed and obstruction at level of hepaticocholedochocystic confluence

REPORT OF A CASE

S L, a Brazilian mulatto farmer, married, 34 years old, came to me from his residence at Fazenda São Joaõ (Agua do Tangara) Cornelio Procopio, State of Paraña

In the course of a Reich Polya gastrectomy the hepatic duct had been accidentally ligated near the point of emergence from the liver The patient entered the Servico de Cirurgia Homens, and I operated again on Aug 14, 1953, with the assistance of Drs Nestor de Oliveira and Antonio G Passos The anesthetist was Dr Pereira Leite

The abdomen was opened by an incision following the line of the first incision The gall bladder showed epiploic adhesions, which were undone Puncture of the gallbladder with a large needle gave negative results

At the level of the hepatocholedochochole cystic confluence I observed a hard block of adhesions as large as a nut (Fig 14) Puncture of the hepatic duct at that level gave negative results The dissected cystic duct, up to its ending into the hepatic portion of the choledochus, was obstructed and lost among adhesions I proceeded to dissect the main biliary canal up to its point of emergence from

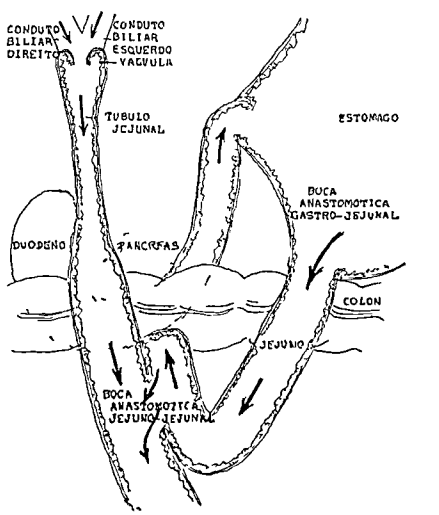

Fig 15 — Tubulovalvular hepatojejunostomy, with exclusion of loop *en Y* and lnterolateral antiperistaltic precolic jejunojejunostomy Precolic (Reich-Polya) gastrectomy

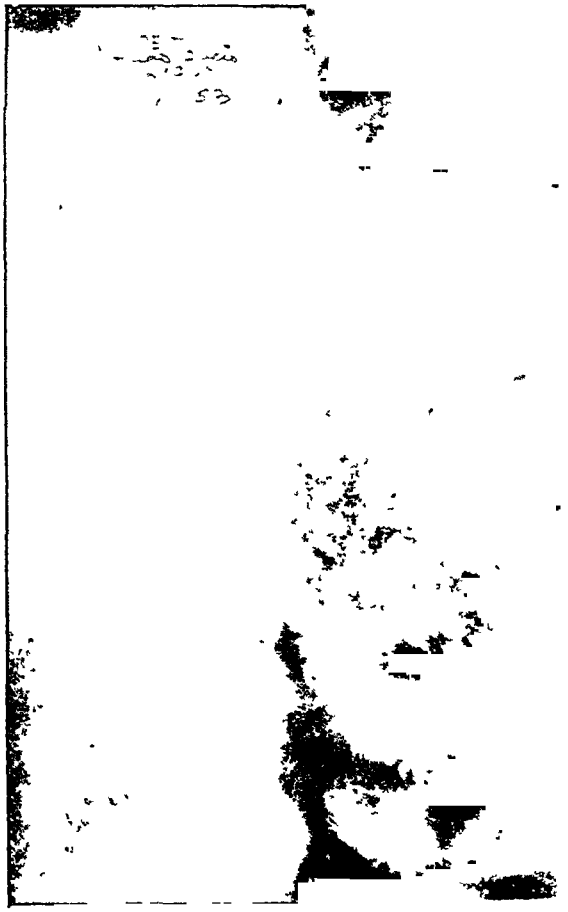

Fig. 16.—Roentgenogram of S. L., showing that *contrast medium filled afferent loop and passed to* efferent loop through anastomotic mouth. Note absence of reflux to interior of the tubulojejunal channel, in spite of maneuver performed to provoke it.

the hilum of the liver. An opening made on its right border permitted outflow of a large quantity of clear aqueous liquid, without biliary pigments (hydropsy) of the biliary canals. Retrograde catheterization with a Nelaton No. 15 probe and a ureteral catheter showed frank permeability of the right and left intrahepatic canals, from which the aforementioned colorless liquid continued to flow. An operative cholangiographic study was made by injecting a contrast medium through a Nelaton probe introduced into the cavity of the biliary duct and fastened to the walls by means of a tobacco-box suture. Since the gallbladder was excluded from the biliary circuit, it was removed (anterograde cholecystectomy). The hepatic duct was then cross-sectioned at the level of the obstruction, and through its opening the confluence of the right and left biliary ducts could be seen perfectly.

I then performed a tubulovalvular hepatojejunostomy with exclusion of the loop en Y and laterolateral anisoperistaltic precolic jejunojejunostomy, taking advantage of the position given to the efferent loop in the operation previously performed (Fig. 15). In the peritoneal cavity a Penrose drain was inserted, and I proceeded to close the wall in layers.

Five days after the operation a biliary fistula appeared, which, however, healed spontaneously some days later.

On September 9 a radiologic examination was made in order to determine whether there existed a reflux of the digestive material to the interior of the principal biliary canals through the jejunal tubule. The examination, made by Dr. J. M. C. Cabelo Campos, chief of

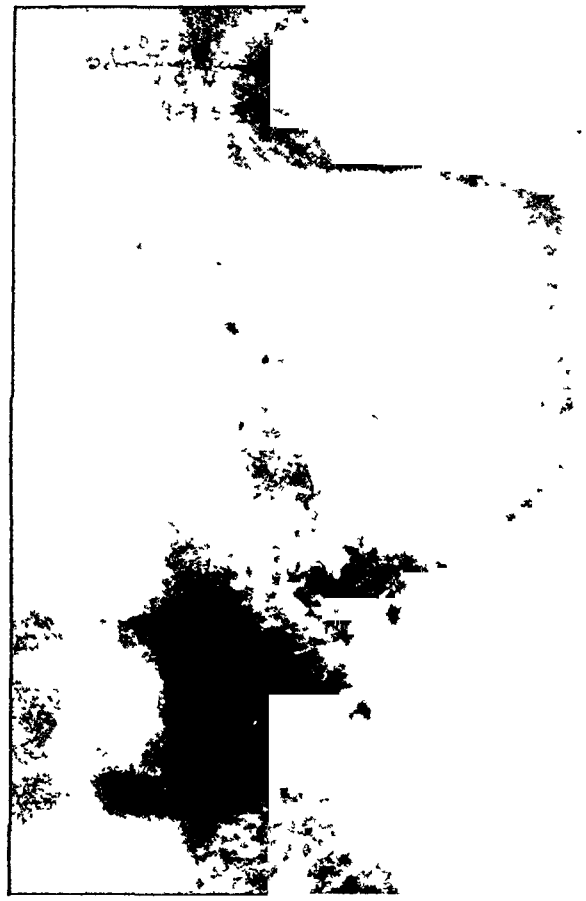

Fig. 17.—Contrast medium passed gastroenteric and enteroenteric anastomotic mouths and, in spite of being impelled by palpatory and compressive maneuvers against cavity of tubulojejunal channel, did not reflow to biliary canals. There was no penetration of contrast medium into cavity of tubulojejunal. Pin visible in picture fixes drain to cerecloth of bandage.

the Radiology Service of Santa Casa, revealed the gastrectomized stomach reduced to a small pocket (resection of the antrum and of the inferior pole of the stomach). The gastroenteric anastomotic mouth was well situated and showed normal permeability.

The laterolateral jejunojejunostomy showed a good antiperistaltic position, with the anastomotic orifice functioning perfectly. The contrast medium showed no reflux to the efferent jejunal loop that had been surgically anastomosed to the hepatic canal. A "bottom of a bag" was present in the upper part of the afferent loop. The patient was examined, at various times, in the oblique, decubitus and Trendelenburg positions, with adequate compression and forced palpatory maneuvers, and it was verified that both the gastroenteric and the enteroenteric anastomosis functioned perfectly and that there was no reflux of the contrast medium either to the efferent anastomosed loop or to the biliary canaliculi (Figs. 16, 17, 18 and 19). The patient was discharged as cured on Sept. 14, 1953.

Fig. 18.—The contrast passed the gastroenteric and enteroenteric anastomotic mouths and did not reflow to tubulojejunal channel.

Fig. 19.—Roentgenogram taken after patient had been put in various positions and orientations (oblique, decubital, and Trendelenburg) and subjected to adequate compressions and palpatory abdominal maneuvers. There is no reflux to the efferent loop or to the biliary canaliculi.

Advantages of the Procedure.—In addition to the advantages I have already pointed out, I should like to enumerate the following points:

1. The efferent loop, in the form of a tubule, is excluded in the true sense of the word, because of its disposition in relation to the transit of intestinal contents and the absence of peristaltic movements, which cannot take place once the circular muscle fibers of the walls have been sectioned to any great extent. This takes place during the postoperative period and is responsible for the frequent dehiscence of the suture associated with biliary-jejunal anastomoses.

2. The suture in two planes for formation of the jejunal tubule buries the mucosa and diminishes the intestinal lumen to such a point as to render it virtually useless, at the same time removing the surfaces of the circular muscular fibers from one another and thus preventing their regeneration. The bile empties easily through the new duct, owing to gravity and the impulse supplied by the intracanicular biliary pressure.

3. Direct anastomosis of the walls of the dilated biliary duct with the jejunal serosa 0.5 cm. from the free border of the invaginated portion offers improved conditions for cicatrization and maintains an ample cavity in this duct without the risk of subsequent stenosis. The valvular disposition and anastomotic constitution of the intestinal walls permit a solid suture, without any traction, between the latter and the walls of the dilated biliary duct or those of a normal-sized duct.

4. The length calculated for the jejunal tubule and the numerous plications of the mucosa reduce the cavity to virtual nonexistence, plus the inextensibility of its walls due to the resistance exerted by the scar at the level of the seroserosal suture are factors that make it difficult for the digestive material to flow back to the interior of the tubule or to the interior of any of the principal biliary ducts.

5. The laterolateral jejunojejunostomy and the cross section of the circular intestinal muscle fibers permit variation in the size of the anastomotic orifice. The existence of a "bottom of a bag" at the terminal part of the afferent loop, since this "bottom of a bag" is sutured along the wall of the inferior portion of the jejunal tubule, assumes great importance in solving the problem of reflux of digestive material to the interior of the biliary canals. Under these conditions, the peristaltic waves originating in the afferent loop stop at the level of the anastomotic orifice; the digestive material flows, to a great extent, to the efferent loop, while the remainder, which has moved to the "bottom of the bag," flows back, thanks to gravity, along the upper spur that marks the line of division between the anastomosed loops, in the direction of the anastomotic orifice. The antiperistaltic waves that rise in the efferent loop below the anastomotic mouth stop at its level and cannot continue in the direction of the biliary-digestive anastomosis, because the circular muscle fibers have been cross-sectioned not only at the level of the os but throughout the length of the jejunal tubule.

SUMMARY

The author's personal technic for tubulovalvular biliary-jejunal anastomosis is presented and illustrated. To demonstrate its advantages, he compares its technic and results with those of other more or less similar procedures.

SUMARIO

O autor apresenta e ilustra sua técnica pessoal de anastomose biliarjejunal tubulocalvular. Para demonstrar suas vantagens, compara sua ténica e resultados com aqueles de outros métodos mais ou menos semelhantes.

RIASSUNTO

L'autore descrive e illustra une tecnica personale di anastomosi bilio-digiunale che avrebbe dei vantaggi su altre tecniche analoghe.

RÉSUMÉ

L'auteur présente et illustre sa technique personnelle d'anastomose biliaire-jéjunale. Il énumère ses avantages en comparant sa méthode et ses résultats à d'autres procédés plus ou moins semblables.

ZUSAMMENFASSUNG

Der Verfasser beschreibt und illustriert seine Technik der Anlegung einer tubulo-valvulären Anastomose zwischen dem Gallensystem und dem Jejunum. Er erklärt die Vorzüge seines Verfahrens im Vergleich mit der Technik und den Ergebnissen anderer mehr oder weniger ähnlicher Operationen.

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Most surgeons, in however general a way they have started and however "general" they may wish to remain, become to some extent specialists as they grow older, because they are attracted more and more to work of a special kind, because chance association or some feature of the district in which they work brings them many cases of a particular nature, or because they are recognized by their fellows as being unusually skilled in some form of treatment, and are asked to undertake it to an extent that practically excludes other work.

Such specialization, which is the natural outcome of a man's inclinations and ability, is inevitable, indeed highly desirable. All specialism, whether medical or surgical, has originated thus in the vision, energy, and enterprise of one man or a group of men, but it tends to be perpetuated by men of a different type. It is against the closed shop, designed to keep the privileges and emoluments of practice to those within the fold, removing its recruits at an early age from the competitive struggle of general medicine and surgery, and tending therefore to attract men in search of safety and an assured income rather than of adventure and discovery, that criticism must be levelled.

—*Ogilvie*

A New Surgeon's Aid

GERALD N. WEISS, M.D., F.A.C.S., F.I.C.S., D.A.B.S.

LAKE CHARLES, LOUISIANA

THE necessity for fixation of a gauze sponge over the forceps applied to the distal end of the stomach during gastric resection (Fig. 1) has been obviated in my practice by the devising of a new instrument, which has been manufactured under my supervision and is now available.* If the sponge is replaced with this device there is less danger of contamination of the wound; an additional advantage is that much operating time is conserved.

The instrument is a simple one, as the illustration shows. A stainless steel clip adapted to the biting end of a standard Mayo-Ochsner seven and one-fourth inch (18.3 cm.) forceps is used (Fig. 2). The clip may also be applied to other gastrointestinal forceps, such as the Pean or the Bainbridge. A spring mechanism provides ready adaptation and adjustment, as well as security that prevents any slipping once the clip is in position.

This new surgeon's aid has also been used successfully (1) in resection of other intestinal segments and (2) on forceps remaining on segments of bowel brought through onto the abdominal surface.

From the Goldsmith Clinic, Lake Charles, Louisiana.
*From the J. Sklar Manufacturing Company.
Submitted for publication May 20, 1956.

SUMMARY

A new surgical aid devised by the author, a clip to replace the gauze sponge usually placed over forceps applied to the distal end of the stomach during gastrectomy, is introduced. According to the author's experience, its employment decreases the danger of contamination and conserves much operating time. Constructed with a spring mechanism that makes it easily adjustable to various types of forceps and prevents slipping once it is in position, the clip is adaptable enough to find various other uses, e.g., in the re-

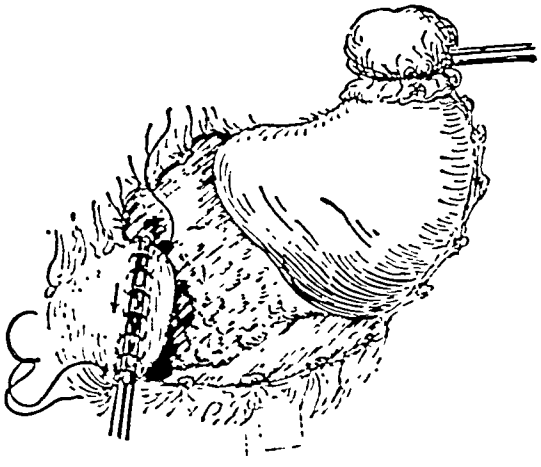

Fig. 1.—Conventional technic for gastric resection, with sponge tied over clamp at distal end of stomach.

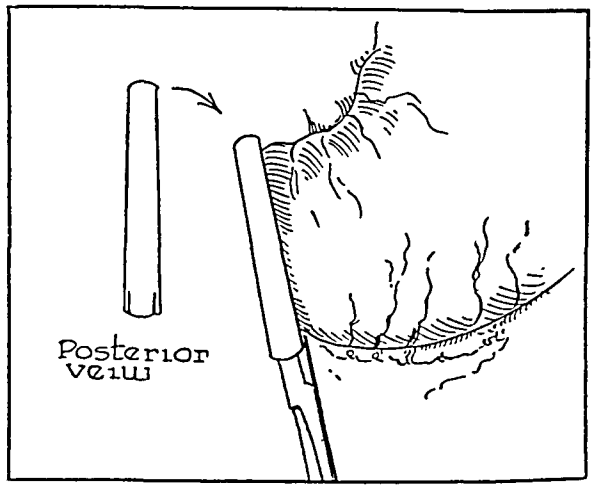

Fig. 2.—Time-saving, space-saving new surgical clip applied over May-Ochsner forceps, replacing the conventional sponge.

section of segments of intestine and in providing security of hold for forceps remaining on bowel segments brought through onto the abdomen.

Two views of the clip itself are shown in Figure 3.

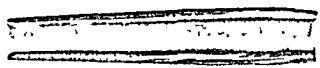

Fig. 3.—Actual photographs of new clip.

RESUMÉ

L'auteur présente un clip imaginé par lui pour remplacer le tampon de gaze habituellement placé sur l'écraseur à l'extrémité distale de l'estomac pendant la gastrectomie. D'après l'expérience de l'auteur son utilisation diminue le danger de contamination et raccourcit le temps opératoire. Construit avec un mécanisme de ressort qui le rend facilement adaptable à différents types d'écraseurs et évite le glissement une fois en place, ce clip est utilisable dans un grand nombre de cas, comme par exemple la résection de segments intestinaux; il assure aussi la sécurité de prise de l'écraseur maintenu sur des segments intestinaux passés à travers l'abdomen.

RIASSUNTO

Descrizione di un nuovo strumento da usare durante la gastrectomia. Secondo l'esperienza dell'autore, il suo impiego diminuisce il pericolo di contaminazione e fà risparmiare molto tempo. Oltrechè nella gastrectomia, tale strumento si dimostra utile anche in altri interventi sull'intestino.

RESUMEN

El autor ha ideado un clip para substituir a la gaza que generalmente se coloca sobre la pinza aplicada a la parte distal del estómago durante la gastrectomía. Según su experiencia el empleo de dicho coadyuvante quirúrgico disminuye el peligro de contaminación y el tiempo operatorio. El clip, que está construído con un mecanismo de resorte, es fácilmente adaptable a diversos tipos de pinzas y no se resbala una vez que ha sido colocado; es adaptable a otros usos, v. g., en la resección de segmentos de intestino y para dar seguridad a la pinza que permanece en los segmentos de intestino.

SUMARIO

O autor apresenta um novo auxiliar cirúrgico de sua invenção, um "clip," para substituir a esponja de gaze, colocado sôbre o forceps aplicado à extremidade distal do estômago durante a gastrectomia. De acôrdo com a experiência do autor, seu emprêgo dimimui o perigo da contaminação e poupa muito tempo operatório. Construido com um mecanismo de mola que o torna fàcilmente ajustável a vários tipos de forceps e impede e escorregamento uma vez em posição, o "clip" é bastante adaptável para ter outros usos, por exemplo, na ressecção de segmentos do intestino e para proporcionar segurança de fixação para que o forceps que fica nos segmentos do intestino seja trazido para o abdomen.

ZUSAMMENFASSUNG

Der Verfasser führt eine neue von ihm erfundene chirurgische Klemme ein, die den Gazebausch, der gewöhnlich bei Magenresektionen über die am distalen Magenende angelegte Klemme aufgesetzt wird, ersetzen soll. Nach der Erfahrung des Verfassers setzt die Anwendung des Instruments die Gefahr der Verunreinigung herab und verkürzt die Dauer der Operation. Die Klemme is mit einem Federmechanismus versehen, der eine leichte Anpassung an verschiedene Formen von Klemmen gestattet und ein Abrutschen aus der gewählten Lage verhütet. Die Klemme ist so anpassungsfähig, dass sich noch verschiedene andere Verwendungsmöglichkeiten für sie finden lassen, wie z.B. bei der Resektion von Darmsegmenten und zur Sicherung der Lage von Klemmen, die an nach aussen verlagerten Darmabschnitten angebracht sind.

My opponents will say that many sick men have never seen a doctor and yet have recovered from their illnesses. I do not doubt it. But it seems to me that even those who do not employ a doctor may chance upon some remedy without knowing the right and wrong of it. Should they be successful. it is because they have employed the same remedy as a doctor would use. And this is a considerable demonstration of the reality and the greatness of the science. when it be realized that even those who do not believe in it are nevertheless saved by it. For when those who employ no doctors fall sick and then recover. they must know that their cure is due either to doing something or to not doing it. It may be fasting or eating a great deal. drinking largely or taking little fluid, bathing or not bathing, exercise or rest. sleep or wakefulness, or perhaps it is a mixture of several of these that is responsible for their cure. If they benefit. they cannot help but know what benefited them: if they are harmed. what harmed them; but everyone cannot tell what is going to bring benefit or harm beforehand. If a sick man comes to praise or to blame the remedies by which he is cured, he is employing the science of medicine. The failure of remedies too is no less a proof of the reality of the science. Remedies are beneficial only through correct applications, but they are harmful when applied wrongly. Where there are procedures which can be right or wrong. a consideration of these must constitute a science. I assert that there is no science where there is neither a right way nor a wrong way. but science consists in the discrimination between different procedures.

—*Hippocrates*

Intraspinal Tumors in Infants and Children

HENRY W DODGE JR M D, M S, HADDOW M KEITH, M D,
AND MARIO J CAMPAGNA, M D,*
ROCHESTER, MINNESOTA

INTRASPINAL tumors in infants and children present problems in diagnosis that differ from those associated with similar lesions in adults In general, the diagnosis is more difficult because these lesions occur rather infrequently in infants and children in comparison with those in occurrence in adults or with the occurrence of inflammatory lesions of the spinal cord in children Furthermore, these young patients are not able to communicate adequately or may not be aware of the fine changes in sensation or power that will lead the average adult to seek medical consultation In addition, infants and young children are unable to cooperate as well as adults during neurologic examination That these factors do hinder the diagnosis of intraspinal lesions is evidenced by the fact that a higher percentage of spinal cord tumor in children is reported in necropsy series than in operative series

In 1888, Horsely and Gowers[1] reported a necropsy series of tumors of the spinal cord, in which 10 per cent of the subjects were children Collins and Marks[2] recorded the cases of 6 children in a necropsy series of 40 and only 1 out of 30 in an operative series In the large surgical series of Frazier[3] and of Elsberg,[4] there were only 5 cases in each series in which the tumors had occurred in children

Many workers have analyzed cases of intraspinal lesions in children The larger series include reports by Hamby,[5] Ingraham and Matson,[6] Anderson and Carson,[7] and Svien and his associates[8] Many smaller series and interesting single cases have been reported[9]

Hamby collected 214 cases of intraspinal tumor in children reported in the literature over a period of 20 years He noted that glioma, sarcoma, dermoid tumor and neurofibroma, in that order, were the most frequent Ingraham and Matson reported 63 cases of their own, the patients being children less than 12 years of age The incidence of the various types of tumor in their series differed from Hamby's in that teratoma, dermoid cyst, astrocytoma and neuroblastoma were the most common They stated that, in children, the meningeal tumors, which are common in adults, are replaced by the congenital tumors

In Anderson and Carson's series of 21 cases the most frequent tumors were gliomas, neurofibromas and then sarcomas They did not report any congenital tumors As will be seen later, we did not find any teratomas, dermoid cysts or meningiomas We were aware of this discrepancy and thoroughly searched our records to assure that such cases were not overlooked The youngest us

From the Section of Neurologic Surgery (Dr Dodge) and the Section of Pediatrics (Dr Keith) Mayo Clinic and Mayo Foundation The Mayo Foundation Rochester Minnesota is a part of the Graduate School of the University of Minnesota
*Fellow in Neurosurgery Mayo Foundation
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Submitted for publication June 10 1956

far at the Mayo Clinic with a verified intraspinal dermoid tumor was 20 years of age.

In 1954, Svien, Thelen and Keith statistically summarized the 41 cases of intraspinal tumors seen in children at the Mayo Clinic from 1920 through 1949. Their findings are incorporated in this study.

Cases Studied and Purpose of Study.—A detailed clinical analysis was made of the case records of 56 infants and children with intraspinal tumors seen at the Mayo Clinic in the thirty-five years from 1920 through 1954. For this study, the pediatric age limit was arbitrarily set at the fifteenth birthday. Meningeal implantations from intracranial neoplasms, lipomatous malformations associated with spina bifida, inflammatory lesions or protruded intervertebral disks were excluded. In the consideration of the subject, emphasis is placed on the important factors that may lead the physician to suspect intraspinal neoplasm in infants and children and thus lead to an early definitive diagnosis.

TABLE 1.—*Summary of 99 Intraspinal Lesions in Infants and Children: 1920-1954*

	Cases		
Suitable for Analysis			56
Intramedullary tumors		18	
Glioma	12		
Astrocytoma*	7		
Lesion not biopsied	3		
Ependymoma	2		
Hemangioendothelioma	2		
Lipoma	2		
Racemose angioma	2		
Metastatic neoplasm	1		
Extramedullary tumors		38	
Neorofibroma	10		
Sarcoma	8		
Metastatic neoplasm	6		
Ependymoma of filum	4		
Giant cell tumor	3		
Arachnoid cyst	1		
Benign fibrous dysplasia	1		
Chordoma	1		
Lymphoblastoma	1		
Hemangioendothelioma	1		
Surgically unverified	2		
Not Suitable for Analysis			43
Congenital anomalies	12		
Protruded disk suspect	1		
Meningeal implant from intracranial neoplasm	13		
Suspected but not verified intraspinal lesion	17		

*One patient with an astrocytoma also had an extradural fibromyxosarcoma.

From 1920 through 1954, 99 children with suspected intraspinal neoplasms were studied at the clinic (Table 1). Fifty-six of these cases were suitable for our analysis; 43 were not. In the latter group, the 12 cases of congenital anomaly included 11 cases of spina bifida with myelomeningocele and varying degrees of myelodysplasia. The 11 patients also had associated intraspinal and extraspinal lipomas. It seemed likely that these lipomas were not the main source of difficulty and should not be classified as true intraspinal neoplasms. Furthermore, analysis of the tumors in these cases showed that they have nothing in common with the other intraspinal lesions and have certain features that place them in a class by themselves. The other congenital anomaly consisted of a bony spicule extending through the vertebral canal bisecting a low-lying conus, the so-called diastematomyelia.

The protruded disk occurred in a 13-year-old boy with an excellent history, who presented the physical signs of protrusion of a lumbar intervertebral disk. Pantopaque myelographic study showed an extradural midline defect at the lumbosacral interspace.

Of the 13 patients with metastatic intraspinal lesions from proved intracranial neoplasms, 8 had medulloblastomas; 3, ependymomas; 1, astrocytoma, and 1, oligodendroglioma. In 3 of the patients the signs and symptoms referable to the spinal cord preceded the intracranial manifestations; therefore, the diagnosis

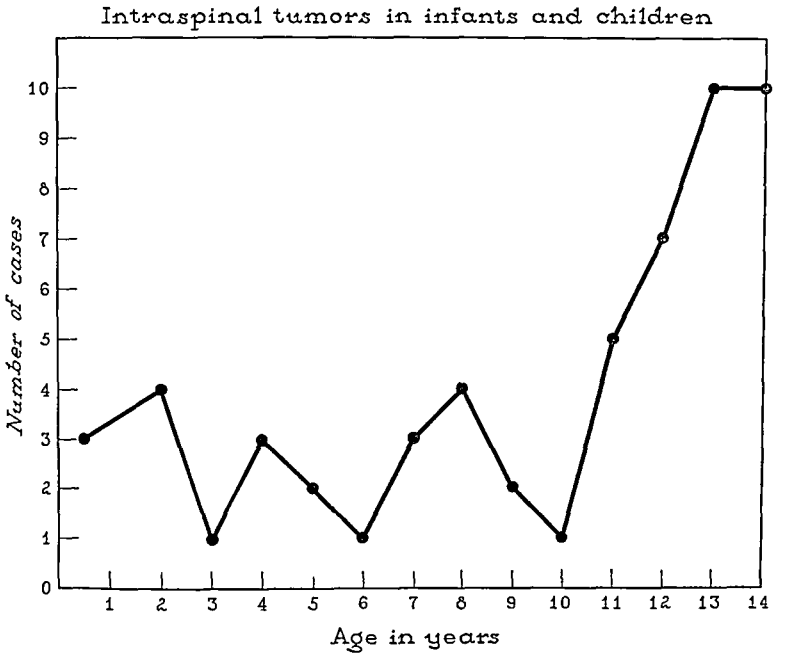

Fig. 1.—Age distribution of 56 infants and children with intraspinal tumors.

was made during the exploratory laminectomy. Seventeen patients were suspected of having intraspinal lesions; pathologic verification of some of these lesions was not possible, and others were proved to be another disease. These lesions will be discussed in the section on differential diagnosis.

Nature and Location of Neoplasms.—Nature: Of the 56 patients whose histories were suitable for analysis, 18 (32.1 per cent) had intramedullary tumors. Glioma was the most common tumor in the entire group, being present in 21.4 per cent of the 56 cases. This frequency agrees well with the observations of others. The largest number of these were astrocytomas. One of the patients harboring an astrocytoma also had an associated extradural fibromyxosarcoma, but most of the difficulty seemed due to the intramedullary astrocytoma. Although in 3 cases biopsy was not performed, the external appearance of the spinal cord at operation warranted the surgeon's diagnosis of intramedullary glioma. The other two gliomas were ependymomas.

A portion of each of the two intramedullary lipomas was extramedullary, as is often the case,[10] but the surgeon stated that the major portion was intramedullary; therefore, it was decided to include

the two tumors in this group.

Of the 38 (67.9 per cent) extramedullary lesions, neurofibromas (10) were the most common, followed closely by a heterogeneous group of sarcomas (8) and then by the metastatic neoplasms (6). The remainder of the extramedullary lesions varied in type.

Three of the 10 neurofibromas were of the dumbbell type. Although Ford[11] stated that neurofibromas in children are usually associated with von Recklinghausen's disease, only 2 patients had this condition, and from 1 of these, two separate intraspinal neurofibromas were removed on different occasions. Another patient, apparently without von Recklinghausen's disease, had multiple neurofibromas removed from the cauda equina.

The 8 sarcomas were encountered in the tissue surrounding the spinal cord. The group consisted of 3 osteogenic sarcomas, 2 lymphosarcomas, a reticulum cell sarcoma, a neurogenic sarcoma and a spindle cell sarcoma. Three anaplastic neoplasms, 2 Ewing's tumors and 1 carcinoma of the thyroid comprised the group of metastatic lesions with intraspinal extensions.

The two surgically unverified lesions were visible roentgenographically; 1 was located retroperitoneally and the other intrathoracically. Both patients had marked involvement of the spinal cord, considered to be associated with the intraspinal tumors. These tumors were inoperable.

Location: The intraspinal tumors were located throughout the spinal column, with none of the predilection for the cervical and lumbar regions reported by some authors (Table 2). This is due in part to the fact that congenital anomalies were not included in the series and in part to the fact that no congenital tumors were encountered.

TABLE 2.—*Location of 56 Intraspinal Tumors in Infants and Children*

Site	*Intramedullary*	*Extramedullary*	*Total*
Cervical	7	8	15
Thoracic	6	13	19
Lumbar	5	15	20
Sacral	0	2	2
Total	18	38	56

Age and Sex of Patient.—The age distribution curve (Fig. 1) is interesting. A sharp rise occurred in the number of patients from the eleventh to the end of the fourteenth year of age. This agrees with the series collected by Hamby. This rise is not noted when the pediatric age limit is set at 12 years, as it is in some reported series. Inclusion of the congenital anomalies in this group would have caused an increase in the number of tumors presenting during the first few years of life. Except for the congenital anomalies, there was no correlation between the type of tumor and the age of the patient. No preponderance of either sex was observed; 29 of the patients were male and 27 were female.

Symptoms.—The chief complaints of the 56 patients with intraspinal lesions are considered in Table 3. When compared to the complaints of adults, the variety is limited, because children may not be aware of, or may have difficulty in communicating their awareness of, minute disturbances of sensation or strength.

The most frequent complaint was weakness or paralysis of one or more limbs. This usually indicated that the spinal cord was already damaged and was more commonly associated with intramedullary than with extramedullary tumors, as was to be anticipated from their location. Root pain, the next most common symptom, was most often associated with neurofibroma since a great majority of tumors of this type originated from the spinal nerve roots. Surprisingly, 5 of the 18 patients with intramedullary neoplasms had

TABLE 3.—*Chief Complaints of 56 Infants and Children with Intraspinal Tumors*

Chief Complaint	18 Intramedullary Tumors	38 Extramedullary Tumors					Total
		Neurofibroma	Sarcoma	Metastatic Neoplasm	Ependymoma of Filum	Miscellaneous	
Weakness or paralysis of one or more limbs	11	2	2	2	1	1	19
Root pain	5	6		2	1	1	15
Back pain	1		6	2	1	4	14
Scoliosis	2	2					4
Dysfunction of bladder or bowel	1				1	1	3
Growth of spine						2	2
Stiff back						1	1

*Some patients had more than one chief complaint.

TABLE 4.—*Duration of Symptoms Prior to Admission in 56 Infants and Children with Intraspinal Tumors*

Duration	18 Intramedullary Tumors	38 Extramedullary Tumors					Total
		Neurofibroma	Sarcoma	Metastatic Neoplasm	Ependymoma of Filum	Miscellaneous	
0-5 mo.	5	2	5	5		5	22
6-11 mo.	1	1	1			3	6
1-2 yr.	4	3	1	1	3		12
2-3 yr.	2				1	1	4
3-4 yr.	1	2	1				4
4-5 yr.	1	2					3
5-6 yr.							0
6-7 yr.	1						1
7-8 yr.	2						2
8-9 yr.							0
9-10 yr.	1					1	2

root pain as major symptoms. Back pain was usually associated with extramedullary lesions and was accompanied by spasm of the erector spinae muscles and limitation of motion in the back.

Exactly half of the patients had had symptoms for less than one year, and 40 had had symptoms for less than two years (Table 4). In general, intramedullary lesions, as was pointed out by Kernohan and his associates,[12] evolve more slowly than do extramedullary lesions. These authors suggested, as an explanation, that these neoplasms are usually of a low grade of malignancy.

Symptoms of malignant extramedullary lesions, as a general rule, were of the shortest duration. The shortest duration of symptoms (in a case of extramedullary sarcoma) was ten days. The longest was ten years, and biopsy proved that the lesion was a low grade astrocytoma low in the cervical region.

Neurologic Signs.—The neurologic abnormalities were varied and depended largely on the location and type of the lesion. Weakness or paralysis of the lower extremities was common and usually presented as a limp, spastic gait or deformity

of the foot. The usual foot deformity was similar to congenital clubfoot. Hyperreflexia, positive Babinski signs and other indices of involvement of the pyramidal tract were observed frequently.

Although sensory examination of the infants and very young children was difficult, with persistence and patience the examiner was usually able to reach a conclusion as to whether or not there was a sensory level or dermatome loss. The sensory examination is important, and the examining neurologist who is accustomed to handling adults and usually is less experienced in examination of infants and children may find this an irksome and difficult task, since the necessary cooperation on the part of the patient is either poor or nonexistent.

The sensory examination is begun below the suspected level of the lesion and is carried upward. By carefully noting the speed and nature of the response to pinprick, the physician can estimate the degree of sensory loss and locate the sensory level. This procedure is well worth the time and effort, for it may be the key to the diagnosis of an intraspinal tumor. Some children are so upset by pinpricks that other tests should be employed. Since pain and temperature are carried in the same pathways in the spinal cord, it is sometimes helpful to test for a level of thermal sensation by use of hot and cold bottles, rather than to test the sensation of pain.

Spasm of the erector spinae muscles with limitation of the movements of the back and positive results of straight leg-raising tests occurred more frequently with extramedullary lesions. The spasm was usually associated with back pain, and in the absence of other signs of inflammation an intraspinal neoplasm must be seriously considered. Retention of urine and fecal incontinence were usually observed late in the progress of the disease, but the tone of the sphincter ani should always be felt, and abdominal examination may reveal a distended bladder.

Unusual signs are often helpful in localization of the lesion. Two of the patients had unilateral Horner's syndrome. One of these proved to have an intramedullary lesion in the cervical portion of the cord with involvement of the sympathetic pathways, and the other had a metastatic lesion that involved the cervical sympathetic chain. Paralysis of half of the diaphragm was observed in several patients who had lesions in the cervical portion of the cord. This can be detected clinically by comparing the movements of the upper halves of the abdomen during quiet respiration. Fluoroscopic examination will confirm the result.

On the other hand, unusual neurologic signs may be misleading. One of our patients had bilateral papilledema, measured at 4 diopters in each eye, with headaches, nausea and vomiting. Roentgenograms of the skull revealed slight separation of the sagittal and coronal sutures. Even though other symptoms and signs suggested involvement of the cauda equina, ventriculographic study was necessary to exclude an intracranial neoplasm that might have seeded into the spinal subarachnoid space. After this, a large ependymoma of the filum terminale was removed *in toto*. The intracranial signs disappeared shortly after the operation, and, except for some residual neurologic deficit, the boy was well six years later.[13]

Roentgenographic Signs. — The roentgenographic signs are listed in Table 5. Naturally, many patients had more than one roentgenographic abnormality. Erosion of the pedicles, with widening of the canal, was the most frequent. This was always at the level of the tumor and often enabled the surgeon to proceed to an exploratory laminectomy without further diagnostic tests. It was more often the

TABLE 5.—*Roentgenographic Data in Cases of Intraspinal Tumors*

		33 Extramedullary Tumors					
Roentgenographic Data	*18 Intramedullary Tumors*	*Neurofibroma*	*Sarcoma*	*Metastatic Neoplasm*	*Ependymoma of Filum*	*Miscellaneous*	*Total*
Erosion of pedicles or widening of distance between pedicles	11	4	2		1	2	20
Normal spinal column	6	5	3	1	1		16
Erosion of vertebra		1	3	2	2	5	13
Kyphosis or scoliosis	4	1		1	1	3	10
Congenital abnormalities	2	1				2	5
Enlargement of intervertebral foramens		3	1				4
Soft tissue mass		2				2	4
Calcification of mass			1			2	3
Partial or complete collapse of vertebra				2			2
Subluxation of vertebrae		1	1				2
Pathologic fracture of sacrum					1		1
Separation of cranial sutures					1		1

result of intramedullary than of extramedullary lesions.

Roentgenograms of the spinal column were often interpreted as within normal limits, and it should be reemphasized that evidence of normal conditions in a spinal roentgenogram does not exclude an intraspinal neoplasm in a child. The marked contrast between the roentgen picture of the infant's or the child's spine and that of a normal adult, has in the past permitted oversight or misinterpretation. The necessity for the occasional aid of an experienced roentgenologist, familiar with the roentgen problems of infancy and childhood, is obvious.

Destruction or erosion of part of a vertebra was usually associated with malignant lesions and with tumors arising in the vertebrae themselves. Although scoliosis and kyphosis are not often associated with intraspinal lesions in adults, they are commonly present when spinal tumors are observed in children. They may be the only abnormalities present, and do not have to be associated with other abnormalities of the spinal column.[14] The deformity may overshadow any other signs or symptoms, and the physician may be led to believe that the condition is primary idiopathic kyphoscoliosis or is secondary to spondylitis. Each young patient with unexplained scoliosis or kyphosis should undergo thorough investigation for intraspinal neoplasm.

Some roentgenographic signs are specific. Enlargement of the intervertebral foramens was observed only when tumors extended through them. Three such tumors were dumbbell neurofibromas, and the fourth was a sarcoma with intradural and extradural portions. Collapse of several vertebrae was observed with 2 metastatic lesions, and a pathologic fracture of the sacrum was associated with an ependymoma of the intradural portion of the filum terminale

Less common abnormalities consisted of separation of the cranial sutures (this occurred in the aforementioned patient with ependymoma of the filum terminale). Subluxation of a vertebra was seen twice,

once when the bone was involved by a primary malignant lesion and once in association with a neurofibroma and marked deformity of the spinal column.

The Spinal Fluid.—The spinal fluid and the myelographic studies in this series are summarized in Table 6. Such studies were not necessary in all the cases; often the clinical and laboratory data were sufficient to give adequate information as to the nature and location of the lesion, so that proper treatment could be instituted.

Twenty of the 33 patients whose responses to jugular compression were recorded showed complete or partial block of the subarachnoid spinal fluid pathways, while 13 had normal responses; this emphasizes again that a normal response does not exclude an intraspinal lesion. The protein content was not normal in any of the spinal fluid studied. The lowest value for total protein was 70 mg. and the highest 3,000 mg., per hundred cubic centimeters. The degree of elevation did not differ significantly with the various types or locations of the lesions. As a rule, however, in cases in which tumors were causing complete block, the values for protein tended to be higher than in those without complete block. There were, of course, many exceptions to this generalization.

Differential spinal punctures were done in several patients and proved to be a valuable localizing procedure. Years ago Cushing and Ayer[15] showed that the protein content and the xanthochromia are always greater below the level of the tumor than above it. This information, plus a comparison of the response to jugular compression above and below the tumor, yielded valuable localizing data.

Myelographic Signs.—Contrast myelographic study is an invaluable procedure to localize intraspinal lesions or to exclude the presence of such lesions when the diagnosis is doubtful. This test was performed 17 times with filtered room air and lipiodol or pantopaque as the contrast medium. In the majority of patients the medium was introduced into the spinal subarachnoid space below the level of the tumor, and the cephalad flow was studied fluoroscopically or on spot roentgenograms. In 1 case, however, air was introduced into the cisterna magna because no

TABLE 6.—*Data on the Cerebrospinal Fluid and on the Contrast Myelographic Studies in 56 Cases of Intraspinal Tumors*

	18 Intramedullary Tumors	*38 Extramedullary Tumors*
Response to jugular compression	12 trials	21 trials
Complete block	5	11
Partial block	1	3
Normal response	6	7
Total protein in cerebrospinal fluid, mg. per 100 cc.	80 to 2400	70 to 3000
Contrast myelographic findings	7 studies	10 studies
Localizing obstruction or defect in contrast medium	6	9
Negative myelogram	0	1*
Incorrect interpretations†	1	0

*The case of benign fibrous dysplasia involving the fifth lumbar vertebra and the fourth and fifth lumbar roots without deforming the dural sac.
†In 1 case of intramedullary lipoma the myelographic picture was that of an accessory meningeal sac rather than tumor.

fluid could be obtained below the level of the lesion.

In 16 patients the contrast studies gave excellent visualization of one of the limits of the lesion. One patient had a normal myelogram, since the pathologic process was benign fibrous dysplasia involving the fifth lumbar vertebra and the fourth and fifth lumbar roots without deforming the dural sac. In 1 case of intramedullary lipoma, because of the radiolucency of the tumor, the myelographic picture was that of an accessory dural sac rather than a mass lesion, but the localization of the tumor was correct.

Electromyographic study is a relatively new diagnostic procedure and was attempted on only 1 patient, and cooperation was so poor that the result was unsatisfactory. Despite this, it should prove to be an extremely valuable diagnostic aid and should be used oftener in distinguishing myopathic diseases from lesions of the spinal cord or the peripheral nerves.

Differential Diagnosis. — Many conditions may simulate intraspinal tumors in children. Close cooperation of the pediatrician, the neurologist and the neurosurgeon is essential in order that the correct diagnosis may be established if possible before irreversible damage is done to the spinal cord. Many of the young patients are admitted to the hospital for emergency treatment with signs of marked neurologic dysfunction, and adequate time may not be thought available for the finer points of a detailed examination.

Ordinarily the pediatrician will see the patient first, and the responsibility for the orientation and direction of the diagnostic effort may rest largely on his shoulders. Since inflammatory diseases in general are more common in children than in adults, and since inflammatory lesions of the central nervous system are encountered more commonly than are tumors of the spinal cord in children, the examining physician may fail to consider a neoplasm until progressive nerve damage has precluded satisfactory recovery. The individual infant or child may present such confusing variations from the pattern usually associated with intraspinal neoplasms in adults that even the most experienced physician may be led astray.

Often the child or infant harboring a neoplasm of the spinal cord will be examined concurrently with a group of children admitted to the hospital during an outbreak of inflammatory disease, and the true nature of his disability may be overlooked. An epidemic of poliomyelitis offers a good example of this statement.[16] The pediatrician may be misled easily into believing that a child with a neurologic deficit, a stiff neck and a slight elevation of the spinal fluid protein level on spinal puncture, admitted during a local epidemic, has acute anterior poliomyelitis. Case 1 is a typical example of this.

CASE 1.—A 14-year-old white girl was first seen at the clinic on June 21, 1951, because the mother considered that the curvature of the girl's spinal column had increased during the past year. When the child was 4 months old, an exploratory laparotomy of a palpable abdominal mass had revealed bilateral granulosa cell tumors. Both ovaries were removed with the tumors. Subsequent development was normal and hormone therapy was started when the girl was 12 years old. The child's mother was concerned as to whether the increasing deformity of the spinal column during the past year could be evidence of recurrence of the tumors. The child's father and brother had died of "brain tumor."

Physical examination revealed only mild scoliosis in the thoracic region. On routine examination the blood and urine appeared normal, and roentgenograms of the spinal column confirmed the presence of scoliosis. The patient was dismissed with instructions as to physical therapy and told to return periodically for reexaminations.

The patient was readmitted on July 20. Two days prior to this admission she became listless and drowsy and complained of frontal headaches, stiffness of the neck and mild aching in the epigastric region. The tempera-

ture was elevated to 103 F. On the following day she had a sore throat and was referred to the clinic because of the possibility of poliomyelitis.

Physical examination disclosed moderate inflammation of the oropharynx, without exudates or membranes. The entire spinal column was stiff and motion was limited owing to muscle spasm. Spasm of the psoas and hamstring muscles was marked also, and the scoliosis had increased slightly. There was minimal weakness of the anterior tibial and the left ankle jerk were diminished. The clinical impression was poliomyelitis of the paralytic type, but some physicians stated that neuronitis secondary to the pharyngitis could explain the abnormalities.

The blood and urine were again normal. Examination of the spinal fluid revealed normal dynamics. There were 75 mg. of total protein, 70 mg. of sugar and 720 mg. of chlorides per hundred cubic centimeters. The cell count was 1 lymphocyte per cubic millimeter, and smears and cultures failed to yield any organisms.

Physical therapy was employed over the next few months, without any remarkable change in the patient's condition. Neurologic examinations during this time again failed to show any change, and poliomyelitis continued to be the working diagnosis.

In January 1952, weakness of both gluteus maximus muscles, which had not been present previously, was detected on neurologic examination. Therefore, neurosurgical consultation was sought concerning the possibility of further investigations. The second attempt to obtain spinal fluid yielded only a few drops of bloody fluid from the fourth lumbar interspace, and the protein content was 3,000 mg. per hundred cubic centimeters after correction for blood. Jugular compression revealed complete subarachnoid block. Pantopaque myelographic study was done on the following day. The needle was inserted into the second lumbar interspace, and at this level the response to jugular compression was normal. There was a complete block to the caudal flow of the oil at the level of the third lumbar interspace (Fig. 2). The protein content of the spinal fluid above the block was 250 mg. per hundred cubic centimeters.

Exploratory laminectomy was done on Jan. 26, 1952, with removal of a large dumbbell

Fig. 2 (Case 1).—Complete obstruction to caudal flow of contrast medium by intraspinal neoplasm; *A*, anteroposterior view; *B*, lateral view. Note smooth rounded defect at lower end of column of oil produced by cephalic end of intraspinal neoplasm. Obstruction to flow was at third lumbar interspace.

neurofibroma from the fourth lumbar interspace on the left. The tumor presented extradurally as well as intradurally; it weighed 6 Gm. and measured 4 by 2 by 2 cm. (Fig. 3).

The patient's convalescence was uneventful, and she was sent home with instructions to continue physical therapy. Eighteen months after operation, she was completely asymptomatic and appeared entirely normal on physical examination. There was no evidence of scoliosis.

Since the scoliosis, spasm of the erector spinae muscles and neurologic signs disappeared after removal of the tumor, the apparent inflammatory onset was only a "red herring," and the deceptive resemblance to poliomyelitis is a good illustration of the difficulties that may be encountered when infants and young children are being handled.

Another common condition to be considered in the differential diagnosis is spondylitis, either specific or nonspecific. In patients with spasm of the erector spinae muscles and roentgenographic evidence of changes in the vertebral column that suggest inflammatory processes, such diagnoses as tuberculous spondylitis, rheumatoid spondylitis or epiphysitis may be considered. Ordinarily a careful history and physical examination will give clues as to the true nature of the disease, but at times the diagnosis can be made only by exploratory laminectomy.

That rather elusive entity, spinal arachnoiditis, which may mimic tumor but is rarely encountered in children, also should be considered. Hysteria and other emotional problems may be difficult to distinguish from lesions of the spinal cord. A child may refuse to use a limb and only careful neurologic examination will reveal a nonanatomic sensory loss or the characteristic signs on muscle testing. Psychiatric evaluation is useful in helping to determine the basic emotional difficulty. Disorders of the spinal and extraspinal blood vascular or lymphatic channels should also be included in the examiner's

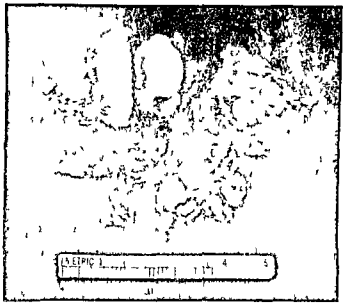

Fig 3 (Case 1) —Pieces of tumor forming dumbbell neurofibroma removed surgically from fourth lumbar interspace

diagnostic preliminary survey.

Lesions of the lower motor neurons which involve the conus medullaris and the cauda equina alone may at times be hard to differentiate from lesions involving the peripheral nerves, such as polyneuritis of the Guillian-Barré type. Examination of the spinal fluid may be of little help, since it may reveal only an elevation in the total protein content. The presence, however, of a block as evidenced by Queckenstedt's test or a defect shown on a contrast myelogram, is highly significant. Electromyographic study is useful in determining whether or not the disease process involves the peripheral or the central nervous system.

The younger the infant, the more difficult becomes the task of differentiation between certain general disorders and neoplasms of the spinal cord. Certainly, congenital spinal dysraphic conditions must always be tentatively considered and ruled out. Primary muscular disorders, such as amyotonia congenita or infantile muscular atrophy, may present an unusual diagnostic dilemma in the case of an infant who seems to be weak and to have [illegible] muscle substance. [illegible] example.

Fig. 4 (Case 2).—Appearance at necropsy of extradural fibromyxosarcoma involving upper three thoracic vertebrae and surrounding tissue.

CASE 2.—On March 30, 1946, a 6-month-old boy was brought to the clinic because his legs would stiffen out during changes of diaper and he would cry whenever he was touched. His birth had been normal, and his development had been satisfactory until two weeks prior to admission when constipation, irritability and stiffening of the legs when his diaper was changed were noted. There had been no febrile illness or other disease.

The infant was well developed and well nourished, but the muscles of the shoulder and pelvic girdles seemed weak and flaccid. He made no attempt to sit up or to raise his head from the mattress. The muscles of the lower extremities were also weak and flaccid, but the muscle stretch reflexes were brisk. Babinski signs were positive bilaterally, but this was not considered unusual for an infant 6 months old. The sensory examination gave normal results.

The blood and urine were normal on routine examination; the chest, the skull and the entire spinal column also appeared normal in the roentgenograms. The differential diagnosis considered by the examining team included amyotonia congenita, myasthenia gravis, infantile muscular atrophy and infantile cerebral diplegia. A prostigmine test failed to improve the strength of the muscles. It was thought best to observe the patient for a time before a definite diagnosis was made. He was dismissed, and the mother was advised to bring him back in the near future for reexamination.

The parents brought the infant back 3 months later. During the interval he had been well except for several attacks of otitis media. Muscle strength had improved somewhat, especially in the upper extremities, which he was able to move well; there was no spontaneous movement, however, of the lower limbs. It was the opinion of several examiners that he could not feel painful stimuli on the extremities and the trunk as well as he could on the face. The stretch reflexes in all the limbs were hyperactive, and Babinski's sign was positive bilaterally. Because of the possibility of an expanding lesion high in the cervical portion of the cord, however, neurosurgical consultation was sought.

Spinal puncture was performed in the third lumbar interspace, where manometric studies revealed a complete spinal subarachnoid block. The yellow spinal fluid contained 1,200 mg. of protein per hundred cubic centimeters. A diagnosis of intraspinal tumor was made. The parents declined to have an operation performed. The child, therefore, was allowed to return home, where he died seven months later.

At necropsy, a lobulated mass was observed over the spinous processes and laminae of the upper three thoracic vertebrae (Fig. 4). The mass was fairly well encapsulated, compressing the dura mater and the spinal cord by extension into the spinal canal through the invertebral foramens. The tumor was diagnosed microscopically as an extradural fibromyxosarcoma.

Examination of the spinal cord showed that it was not severely compressed but that at the level of the second thoracic segment, which was immediately beneath the extradural tu-

mor, was an intramedullary astrocytoma. This was of a low grade and occupied almost the entire dorsal half of the spinal cord (Fig. 5).

Although such entities as amyotonia congenita, muscular atrophy and myasthenia gravis are not ordinarily considered in the differential diagnosis of lesions of the spinal cord, this case illustrates well how a high thoracic or cervical neoplasm in an infant can produce perplexing situations. It also illustrates the need for repeated careful reevaluations when the diagnosis is doubtful, and the necessity for maintaining suspicion until the pathologic nature of the lesion afflicting an infant is identified. The neurologic examination of infants is, by necessity, crude, and reexaminations by the same diagnostic team are invaluable in the formulation of correct opinions.

When an infant is suspected of harboring an intraspinal lesion, the entire spinal column should be studied roentgenographically, and the spinal fluid should be investigated. Response to jugular compression may be extremely difficult to interpret when the infant is struggling and crying, but careful observation of the fluid levels in the manometer under all these conditions may yield important information as to the presence of partial or complete block of the spinal subarachnoid space. Pediatricians know well the value of adequate sedation before such a test. If necessary, general anesthesia may be resorted to in order to obtain satisfactory results from spinal puncture alone. Although none of the particular infants in our study underwent contrast myelographic studies, age *per se* is no contraindication to examination of the spinal subarachnoid space after injection of a contrast medium. Even exploratory laminectomy is not looked on as the formidable procedure it was once considered, and at times it may be the only means of making a positive diagnosis.

Treatment.—The treatment of tumors of the spinal cord in infants and children is, with few exceptions, entirely surgical. Adson,[17] Craig[18] and others have summarized the principles governing the surgical treatment of these tumors.

Whenever possible the surgeon should remove a specimen of the tumor in order that a correct histologic diagnosis can be

Fig. 5 (Case 2).—Transverse section of spinal cord beneath extradural fibromyxosarcoma showing location of lary astrocytoma in dorsal portion of c

made, and then should attempt to remove as much of the neoplasm as possible without damaging the spinal cord. With benign lesions he may effect complete removal. With malignant tumors he may remove as much as possible without further maiming or injuring the little patient. By doing this and by removing bone, the surgeon accomplishes decompression, which provides room for the spinal cord if the malignant tumor recurs. Roentgen therapy may be given when the tumor cannot be removed *in toto*. It is not within the scope of this paper to discuss the prognosis and the effectiveness of the therapy, since the follow-up studies on these patients have not yet been completed and will be reported in a future communication.

In 17 of the 18 cases of intramedullary tumor, exploratory laminectomy was performed. Biopsy was not performed in 3 cases. In 7 cases subtotal removal of the tumor was possible, and in the remaining 7 cases biopsy only was possible. Roentgen therapy was given postoperatively in 10 cases.

Surgical treatment of the neurofibromas had gratifying results. Complete removal was accomplished in 9 cases. In 1 case of von Recklinghausen's disease a second laminectomy was performed, with removal of a separate tumor. None of the patients was given roentgen or radium therapy.

In one of the 8 cases of sarcoma, total removal of the neurogenic sarcoma was thought to be accomplished. In 5 of the remaining cases subtotal removal of the tumor was performed, and in 2, biopsy alone. Roentgen therapy was given in 6 of the 8 cases.

In 3 of the cases in which there were metastatic lesions, the tumors were removed in part, with decompression of the cord, while biopsy only was performed in the remainder. All 6 of the patients were given roentgen therapy after operation. Two of the ependymomas of the filum terminale were removed totally, and the other 2 were only subtotally removed. Only the last 2 patients were given radiation therapy. In the miscellaneous group of tumors the usual procedure was to remove as much of the tumor as possible.

SUMMARY

A detailed analysis of 56 cases of intraspinal lesions occurring in infants and children, observed at the Mayo Clinic from 1920 through 1954, is presented. Eighteen tumors (32.1 per cent) were intramedullary; 38 (67.9 per cent) were extramedullary. The 12 gliomas comprised the largest single group (21.5 per cent). The neurofibromas (17.8 per cent) and the sarcomas (14.3 per cent) were next most common. A sharp increase in the number of cases was evident among children from the eleventh to the end of the fourteenth year of age.

Weakness or paralysis of one or more extremities, root pain and back pain were the most common symptoms. The neurologic signs varied tremendously and were dependent on the site and nature of the lesion. The most frequent roentgenographically evident abnormalities of the spinal column were erosion of the pedicles, with an increase in distance between them, and widening of the spinal canal. Erosion of the vertebral body and kyphoscoliosis were also common. Sixteen (28.6 per cent) of the patients, however, had roentgenographically normal vertebral columns.

Examination of the cerebrospinal fluid with jugular compression studies and determination of the total protein content are invaluable and should be done in all cases in which intraspinal neoplasms are suspected. Contrast myelographic study is useful in localizing the lesion or in excluding gross lesions that deform the dural sac. With few exceptions, the treat-

ment of tumors of the spinal cord in infants and children, as in adults, is entirely surgical.

RÉSUMÉ

Les auteurs présentent une analyse détaillée de 56 cas de lésions médullaires chez des nourrissons et des enfants étudiés à la Mayo Clinic de 1920 à 1954. Dix-huit tumeurs (32,1%) étaient intramédullaires, trente-huit (67(9%) extramédullaires. Les gliomes (12 cas) constituent le groupe isolé le plus important (21,5%). Viennent ensuite les neurofibromes (17,8%) et les sarcomes (14,3%). Une forte augmentation du nombre de cas a été constatée chez les enfants âgés de 11 à 14 ans.

Symptômes les plus courants: adynamie ou paralysie d'une ou de plusieurs extrémités, douleurs radiculaires et dorsales. Signes neurologiques: ils varient énormément et sont dépendants du lieu et de la nature de la lésion. Anomalies radiologiques lés plus fréquentes: érosion des racines, qui sont anormalement écartées les unes des autres, et élargissement du canal médullaire. L'érosion du corps vertébral et la kyphoscoliose ont également téé courantes. Cependant 16 patients (28,6%) présentaient une colonne vertébrale radiographiquement normale.

L'examen du liquide céphalo-rachidien et l'étude de la compression jugulaire, avec la détermination du contenu protéinique total sont des plus précieux et devraient être pratiqués dans tous les cas où l'on suspecte un néoplasme médullaire. La myélographie de contraste est utile pour la localisation de la lésion ou pour l'exclusion de grosses lésions déformant le sac dural. A peu d'exceptions près le traitement des tumeurs de la moelle épinière chez le nourrisson, l'enfant et l'adulte est entièrement chirurgical.

RESUMEN

Se presenta un análisis detallado de 56 casos de lesiones espinales que ocurrieron en niños vistos en la Clínica Mayo de 1920 a 1954. Diez y ocho tumores (32.1 por ciento) fueron intramedulares, 38 (21.5 por ciento) fueron extramedulares. El grupo más grande fué integrado por los gliomas (21.5 por ciento). Los siguientes en frecuencia fueron los neurofibromas (17.8 por ciento) y los sarcomas (14.3 por ciento). Se notó un aumento notable en el número de casos en los niños, de los once años de edad al final de los catorce.

Los síntomas más frecuentes fueron la debilidad y la paralisis de una o de varias extremidades. Los signos neurológicos variaron notablemente y dependieron del sitio y la naturaleza de la lesión. Las anormalidades roentgenológicas más evidentes en la columna vertebral fueron la erosión de los pedículos con una aumento de su distancia y un ensanchamiento del conducto vertebral. Tambien fueron frecuentes la erosión de los cuerpos vertebrales y la cifoescoliosis. Sin embargo, 16 de los pacientes (28.6 por ciento) tuvieron columnas vertebrales roentgenológicamente normales.

De gran valor son el examen del líquido cefaloraquídeo con compresión yugular y la determinación de proteínas totales; deben hacerse en todos los casos en donde se sospeche neoplasias medulares. El estudio mielográfico es útil para localizar la lesión o para excluir lesiones gruesas que deformen el saco dural. Con pocas excepciones, el tratamiento de los tumores de la médula espinal en los niños, como en los adultos, es completamente quirúrgico.

RIASSUNTO

Viene presentata una dettagliata analisi di 56 casi di malattie del midollo spinale in bambini osservati nella Mayo Clinic dal

1920 al 1954. Diciotto tumori erano intramidollari (32,1%), 38 erano extramidollari (67,9%). Nel maggior numero di casi si trattò di gliomi (21,5%) ; seguono i neurofibromi (17,8%) e i sarcomi (14.3%). Evidente l'aumento del numero dei casi nei bambini fra gli 11 e 14 anni. I sintomi più frequenti furono: debolezza o paralisi di uno o più arti e dolori. Le manifestazioni neurologiche, viceversa, variorono enormemente efurono in rapporto con la sede e la natura della lesione. Le più co muni alterazioni della colonna vertebrale, radiologicamente determinabili, furono l'erosione dei peduncoli, che apparivano più distanziati l'uno dall'altro, e l'allargamento del canale midollare. Di comune osservazione furono pure l'erosione del corpo vertebrale e la cifoscoliosi. In contrasto con ciò, tuttavia, in 16 pazienti l'esame radiologico non dimostrò alterazioni della colonna vertebrale. In ogni caso di sospettò tumore midollare debbono anche essere praticati l'esame del liquido cerebro-spinale e la determinazione del suo contenuto proteico, così come lo studio mielografico si dimostra di grande utilità nel localizzare, o nell'escludere, lesioni del sacco durale. La cura dei tumori midollari così dei bambini come degli adulti è, salvo poche eccezioni, chirurgica.

SUMARIO

Uma análise detalhada de 56 casos de lesões intraespinhais em crianças vistas na Clínica Mayo de 1920 a 1954 é apresentada. Dezoito tumores (32.1%) eram intramedulares: 38 (67.9%) eram extramedulares. Os 12 gliomas compreendiam o maior grupo único (21.5%). Os neurofibromas (17.8%) e os sarcomas (14.3%) eram em seguida os mais comuns. Um aumento grande número de casos era evidente entre as crianças de 11 a 14 anos de idade.

Fraqueza de paralisia de uma ou mais extremidades, dor na raiz e dor nas costas foram os sintomas mais comuns. Os sinais neurológicos variaram tremendamente e dependeram do local e natureza da lesão. Roentgenogràficamente as anormalidades evidentes mais frequentes da coluna espinhal foram erosão dos pedículos, com aumento da distância entre êles, e alargamento do canal espinhal. A erosão do corpo vertebral e quifoscolicose foram também comuns. Dezesseis (28.6%) dos pacientes, entretanto, tinham colunas vertebrais roentgenogràficamente normais.

O exame do fluido cerebroespinhal com estudos da compressão jugular e determinação do conteudo total de proteina são invaliáveis e deveriam ser feitos em todos os casos em que se suspeitasse de neoplasmas intraespinhais.

ZUSAMMENFASSUNG

Es liegt ein eingehendes Studium von 56 Fällen von intraspinalen Erkrankungen bei Säuglingen und Kindern vor, die an der Mayo-Klinik von 1920 bis 1954 beobachtet wurden. 18 Geschwülste (32,1%) waren intramedullär, 38 (67,9%) extramedullär. Die grösste Gruppe (21,5%) setzte sich aus zwölf Gliomen zusammen. Es folgten nach Häufigkeit die Neurofibrome (17,8%) und die Sarkome (14,3%). Ein steiler Anstieg der Anzahl der Fälle zeigte sich bei Kindern im Alter von 11 bis 14 Jahren.

Schwäche oder Lähmung einer oder mehrerer Extremitäten, Wurzelschmerz und Rückenschmerzen bildeten die häufigsten Krankheitszeichen. Die neurologischen Befunde waren ungeheuer unterschiedlich und hingen vom Sitz und der Art der Erkrankung ab. Die häufigsten röntgenologischen Anomalien der Wirbelsäule bestanden in Erosionen der Wirbelbogenbasis mit Vergrösserung des Abstandes zwischen der linken und rechten Bogenwurzel und in einer Erweiterung des Wirbelkanals. Erosionen der Wirbelkörper und Kyphoskoliose wurden eben-

falls haufig beobachtet 16 Kranke (28,6%) jedoch zeigten normale Rontgenbefunde der Wirbelsaule

Die Untersuchung der Ruckenmarksflussigkeit mit Kompression der Jugularvene und die Bestimmung des gesamten Eiweissgehalts sind von unschatzbarem Wert und sollten in allen Fallen ausgefuhrt werden, wo der Verdacht einer Geschwulst im Wirbelkanal vorliegt Myelographische Untersuchungen sind von Wert zur Bestimmung des Sitzes der Erkrankung und zur Ausschliessung grober den Duralsack deformierender Verande rungen Mit geringen Ausnahmen is die Behandlung der Geschwulste des Ruckenmarks bei Sauglingen und Kindern genau wie bei Erwachsenen eine ausschliesslich chirurgische

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Tumors of the Brain in Children: Recent Observations

JAMES GREENWOOD JR., M.D., F.A.C.S., D.A.B., AND T. H. McGUIRE, M.D.

HOUSTON, TEXAS

THE surgical treatment of tumor of the brain has been greatly retarded in its development by the expansion of neurosurgery as a whole and the consequent reduction of the number of cases of tumor observed by the individual neurosurgeon. The young neurosurgeon particularly has little chance to obtain experience in the removal of brain tumors and must be satisfied with the results made possible by overall good technical training and skill. Each type of brain tumor requires somewhat different management, which further dilutes the possibility of real contributions to the treatment and surgery of neoplasm of the nervous system. Until there is subspecialization in this branch of neurosurgery, major contributions can come only from the major neurosurgical centers.

The occurrence of brain tumors in children has an incidence only slightly under that in adults, as was indicated by our series, which included 93 children in a total of 510 patients, or a ratio of 1 to 4.4, not greatly different from that recorded for the general population. The treatment of children carries with it extremes of heartache, tragedy, joy and reward, but, if a few simple fundamental principles are observed, children often make better patients than adults. Kindness and honesty go a long way with children, and the friendship of a child should not be pursued but rather should be enticed.

Signs and Symptoms of Brain Tumors in Children. — The symptoms differ to some extent from those in adults, particularly in infants and young children, because of suture separation, because of tumors peculiar to this age, and because the reaction of the child to pain and other symptoms is different from that of the mature person.

An audible intracranial bruit has been noted in 37 per cent of cases of increased intracranial pressure. Vomiting is a rather common symptom in children, while headache is less often a prominent feature. Diplopia, particularly bilateral internal strabismus from bilateral involvement of the sixth nerve, is common with any prolonged or severe intracranial pressure. Papilledema as a rule is less marked, particularly in younger children and in tumors of slow growth, such as cerebellar astrocytoma; and considerable loss of vision may occur because of prolonged chronic choke. Enlargement of the head is often a noticeable feature. In our series, only 11 per cent had seizures. In a group of 800 cases of focal seizures in children, only 25 had tumors (Kellaway[1]).

Aside from the symptoms caused by increased intracranial pressure, truncal ataxia, due to midline cerebellar tumors, is often seen. The ataxia is not marked while the child is lying in bed but becomes pronounced on attempts to rise or to walk. Asynergy and ataxia of the extremities usually is evident to some degree in cases of tumor of the cerebellar hemispheres.

From the Division of Neurosurgery, Methodist Hospital and Baylor University College of Medicine.

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Visual loss may occur, owing to chronic papilledema, or in the presence of suprasellar lesions

Nuchal rigidity from herniation of the cerebellar tonsils is much more common than in adults, and with cerebellar tumors there is often a tilt of the head Nystagmus, less common with midline cerebellar tumors, has a doubtful value in diagnosis, but if it is true nystagmus with coarse movements, the tumor can nearly always be located below the tentorium

Diagnostic Aids —Roentgen examination usually will show suture separation and enlargement of the head in the younger age groups Calcification may be seen in tumors or in the suprasellar area, *particularly in craniopharyngiomas* Erosion of the sella is of some diagnostic value, and occasionally local erosion of the skull, due from an underlying tumor, may be observed Enlargement of the optic foramens in special views may be shown in tumors of the optic nerve Convolutional markings, when increased, have little value, since these in some degree are present in many normal persons This condition is most pronounced in cases of craniostenosis rather than of brain tumors Other diagnostic aids, such as spinal tap or pneumoencephalographic study, should be used only with careful judgment In the presence of a tumor of the brain, the danger of spinal puncture is probably greater for children than for adults Ventriculographic study remains the most useful diagnostic procedure in spite of the inroads of angiographic electroencephalographic and radioactive isotope studies, all of which have some value

Differential Diagnosis —Brain abscess, if well encapsulated, presents a picture no different from that of brain tumor A previous febrile episode, particularly with involvement of the upper part of the respiratory tract or the sinuses, should make one suspicious The electroencephalogram is often diagnostic Torula, toxoplasmosis, tuberculous meningitis, etc, may frequently cause difficulty, and ventriculographic study or even surgical exploration may be needed to settle the issue Pseudotumor cannot be differentiated from true tumor except by ventriculographic study, and even this is not always certain As a rule, the patients do not appear very ill and, of course, show no neurologic signs other than evidence of increased intracranial pressure Hydrocephalus often can be differentiated from other conditions only by air studies Subdural hematoma, particularly in infants, is usually disclosed at the time of ventriculographic examination if it has not been suspected after a difficult delivery or an injury to the head Virus encephalitis will occasionally cause difficulty for a few days, but if operation is delayed in the presence of a good general condition the progress of events should make the diagnosis clear Occasionally atlanto-occipital malformation and the Arnold Chiari malformation are difficult to differentiate from tumor, and suboccipital exploration may be necessary Nothing is lost in this instance, since the treatment of both is surgical Degenerative conditions, such as Schilder's disease, may occasionally produce increased intracranial pressure, and only prolonged studies, including the ventriculographic type, may make differentiation possible Arteriovenous malformations are disclosed angiographically

The postoperative mortality rate for *brain tumors in children is lower than for* adults In our series it was slightly under 6 5 per cent This rate will not be reduced in the future but may be increased, as technical advances lead to attack upon tumors that were at one time inoperable, and to more radical removal in some cases in which there is a possibility of cure By contrast, risky surgical proc es p ably will be discontinued t

of such tumors as the cerebellar astrocytomas, with which complete cure may be possible at a second or third exploration if life is not endangered at the time of the first operation.

Types of Tumors, Location and Management.—The different types of tumors encountered are listed in Table 1.

TABLE 1.—*Brain Tumors in Children (15 Years of Age and Under)*

	Total	Supratentorial	Infratentorial
Medulloblastoma	16	0	16
Astrocytoma	16	7	9
Glioma of brain stem	9	0	9
Ependymoma	6	5	1
Glioblastoma	6	6	0
Craniopharyngioma	5	5	0
Glioma of optic chiasm	4	4	0
Glioma of hypothalamus	2	2	0
Neuroblastoma	2	1	1
Hemangioblastoma	2	1	1
Choroid plexus of angioma	2	2	0
Meningioma	2	2	0
Epidermoid	2	2	0
Granuloma	6	5	1
Arachnoid cyst	2	1	1
Angiomas and arteriovenous malformations	4	2	2
Papilloma of choroid plexus	1	1	0
Pinealoma	1	1	0
Colloid cyst	1	1	0
Ganglioneuroma	1	1	0
Optic nerve of neurofibroma	1	1	0
Meningeal sarcoma	1	1	0
Cysticercus cyst	1	1	0
Totals	93	52	41
Supratentorial	56%		
Infratentorial	44%		

Tumors not encountered: hamartoma, pituitary adenoma, lipoma, melanoma, polar spongioblastoma

TABLE 2.—*Localization of Brain Tumors in 4 Series*

Author	Supratentorial, %	Infratentorial, %
Bailey, Bucy and Buchanan[3]	34	66
Ingraham and Matson[4]	30-40	60-70
Cuneo and Rand[2]	49	51
Greenwood and McGuire	56	44
Gliomas only	40	60

TABLE 3.—*Medulloblastomas (16 Cases)*

Average age: 4 years, 10 months Sex: 13 male, 3 female patients
Treatment: Surgical removal and roentgen therapy
Surgical mortality rate: 6.25 per cent
Average period of survival: 15 months
Average age with survival over 1 year: 8 years
Average age with survival less than 1 year: 3½ years
Average period of survival (over 1 year): 33 months
Average period of survival (less than 1 year): 4 months

The predominance of infratentoral tumors in children reported by other authors (Table 2) did not occur in our series. If we had not included angiomas, arteriovenous malformations and arachnoid cysts, and if the incidence of granulomas had not been a little high, our percentages would have been almost identical with those of Cuneo and Rand.[2] If the tumors peculiar to infancy and childhood, notably medulloblastoma, astrocytoma and glioma of the brain stem, are eliminated, the proportion of supratentorial to infratentorial tumors would be reversed.

Medulloblastoma (Tables 3 and 4): In a group of 16 patients averaging 4 years and 10 months of age, all with infratentorial medulloblastoma, the incidence of

this lesion in the male was four times its incidence in the female There was 1 surgical death The average period of survival was fifteen months The duration of survival was much better in the older group, in which the average age of those who survived more than one year was 8 Of those who survived less than one year, the average age was only 3½ years Of those who lived as long as a year, the average duration of survival was almost three years, while the average survival period of those who survived less than one year was only four months This would indicate a rather high incidence of mortality within two to six months after operation and roentgen therapy, and necropsy material suggests that this probably was due to cerebral and cerebellar reaction and to obliteration of the cerebrospinal fluid pathways caused by absorption of the necrotic tumor material after treatment This has resulted, in recent cases, in an attempt to perform complete surgical removal of the tumor When this is done the postoperative course is much smoother, and both the expectancy of life and the period of normal existence should be extended by it Roentgen therapy usually consists of 2,000 roentgen units delivered to each of three fields in the skull and 1,800 units to two or more fields in the spine This may be repeated in twelve to eighteen months Recurrence or metastasis is often observed above the tentorium and can be revealed ventriculographically These growths may be treated without exploration, and repetition of the air study will show their disappearance Sciatica or nerve root pain due to irritation along the spinal axis can be relieved by roentgen therapy to the appropriate area

Astrocytomas (Table 5) In the group with infratentorial astrocytomas, there were 9 patients, 7 cystic, with an average age of 8 years Seven had supratentorial astrocytomas, their average age was 12,

TABLE 4.—*Medulloblastoma, Treatment*

Primary Lesion
Complete surgical removal (roentgen therapy necrosis causes cerebrospinal fluid block)
Roentgen Therapy (Postoperative)
200 r to 3 fields in skull
Repeat in 12 to 18 months
1 800 r to 2 fields in spine
Metastases (Detected Ventriculographically)
Roentgen treatment of cerebral lesions
Roentgen treatment of spine (sciatica)

TABLE 5.—*Astrocytoma (16 Cases)*

Infratentorial lesions 9 (7 cystic), average age of patients, 8 years
Supratentorial lesions 7 (3 cystic), average age of patients 12 years
Treatment
Evacuation of cyst
Partial or complete removal of tumor, reoperation
Operative Mortality Rates
1 infratentorial lesion, 11%
2 supratentorial lesions, 14%
Postoperative Deaths
From infratentorial lesions, 0
From supratentorial lesions, 1
Average Period of Survival
With infratentorial lesions, 5 3 years
With supratentorial lesions 6 years

and 3 were cystic Treatment consists of evacuation of the cyst and removal, partial or complete, of the solid tumor, which is rarely just a mural nodule No risk should be taken in operating, since reoperation may not only greatly extend the life of the child but may, with these benign tumors, result in complete cure There were 2 postoperative deaths in this group, which could probably have been avoided if the operations had been more conservative For emphasis, we should mention a 4 year-old boy operated on in 1939 and again in 1945, in whose case total removal was finally accomplished in 1948, since

which time he has remained well. As far as we know, all patients who have survived surgical intervention are still living.

Craniopharyngioma: This tumor should be removed if possible. The value of roentgen therapy is controversial, but some benefit has been observed in our cases. Our best results have been obtained with the squamous cell type, from which the fluid was removed with part of the cyst wall through the foramen of Monro. Some additional relief can be obtained by tapping the cyst and passing an indwelling rubber catheter from the subcutaneous tissues into the center of the cavity; in this way the cyst can be drained at intervals by making a small opening through the skin. More radical surgical treatment is possible, with the use of ACTH before and cortisone and pitressin after the operation.

Glioma of the Pons: Surgical intervention is not indicated for these tumors as a rule, though surgical exploration is justified if there is increased intracranial pressure. Moderate benefit may be obtained in some cases from roentgen therapy.

Glioma of the Optic Chiasm: These tumors do not lend themselves to surgical removal, but some benefit may be obtained from roentgen therapy. Recent studies indicate that a more radical attack may be indicated, since in some cases, at least, the tumor might be completely removed with the preservation of one optic nerve and one optic tract, as was done in 1 of our cases. ACTH, cortisone and pitressin are needed postoperatively.

Glioma of the Thalamus and Hypothalamus: Observations indicate that even malignant tumors in this phylogenetically old area of the brain grow much more slowly than do tumors of similar appearance in the cerebrum. Surgical attack, although fraught with danger, is much better tolerated if radical removal is carried out. The worst results are obtained by partial removal, or by removal of a biopsy specimen with no attempt to relieve the block in the cerebrospinal fluid system. Roentgen therapy is rarely effective, and ventriculocisternal shunt does not relieve direct pressure upon the hypothalamus and the brain stem.

Inoperable Tumors: Patients with inoperable tumors in the upper posterior fossa or the posterior region of the third ventricle may often be relieved for a long time by ventriculocisternal shunt.

The Glioblastoma and Undifferentiated Cerebral Glioma: These are much more effectively treated by roentgen therapy than are glioblastomas in adults.

COMMENT

We should like to emphasize again the value of two-point coagulation for control of hemorrhage, with minimal radiation and extension of heat. It is particularly valuable in the posterior fossa, for cortical resections, and for removal of tumors by coagulation and suction, since unseen vessels find their way into the sucker tip and are in position for coagulation.

SUMMARY AND CONCLUSIONS

The incidence, classification, diagnosis, and treatment of brain tumors in children are outlined, with particular reference to new concepts. The advantages of more radical surgical procedures for certain types of tumors, notably medulloblastomas, have become apparent, while a more conservative attitude must be followed with other types, the prime consideration being the greatest benefit to the patient. The hopeless prognosis of certain tumors, such as glioma of the brain stem, at least from the surgical point of view, must be admitted. With technical improvement, the surgical mortality rate has become low but probably will not be reduced further,

since such developments bring hope for the removal of lesions heretofore considered inoperable

RÉSUMÉ ET CONCLUSIONS

L'incidence, la classification, le diagnostic et le traitement des tumeurs cerebrales chez l'enfant sont discutes, avec des references particulieres a certaines conceptions nouvelles Les avantages des techniques chirurgicales plus radicales pour certains types de tumeurs, notamment les medulloblastomes, sont devenus evidents, alors qu'une attitude plus conservatrice doit être adoptee dans d'autres cas, la premiere consideration etant le bien du malade Le pronostic sans espoir de certaines tumeurs telles que le gliome du tronc cerebral doit etre admis, du moins du point de vue chirurgical Avec les progres techniques le taux de mortalite operatoire s'est abaisse, mais il ne pourra probablement pas être reduit davantage du fait que ces progres permettront l'ablation de lésions considérées jqu'ici comme inopérables

SUMARIO E CONCLUSOES

A incidência, classificação, diagnostico e tratamento de tumores cerebrais em crianças são descritos, com referência especial aos novos conceitos As vantagens dos metodos cirurgicos mais radicais para certos tipos de tumores, notadamente meduloblastomas, tornaram se aparentes, enquanto uma atitude mais conservadora deve ser seguida com outros tipos, sendo a principal consideração o maior beneficio do paciente O prognostico sem esperança de certos tumores, tais como gloma da haste cerebral, pelo menos sob o ponto de vista cirurgico, deve ser admitido Com a melhoria tecnica, a mortalidade cirurgica tornou-se baixa, mas provavelmente não sera *mais reduzida, uma vez que* tais desenvolvimentos trazem esperança para a remoção de lesões ate aqui consideradas inoperaveis

RIASSUNTO E CONCLUSIONI

Si riferiscono la classificazione, la diagnosi e la cura dei tumori del cervello nei bambini, con accenni particolari ai nuovi concetti Si sono fatti evidenti i vantaggi delle tecniche chirurgiche piu radicali nella cura di alcuni tipi di tumori, specie i medulloblastomi, mentre per altri tipi sono preferibili metodi piu conservativi *Deve essere riconosciuta la prognosi* disperata, almeno dal punto di vista chirurgico, di certi tumori come i gliomi dei peduncoli cerebrali Con gli attuali progressi tecnici la mortalita operatoria e divenuta veramente bassa ma, probabilmente, non diminuira ulteriormente per il fatto che i suddetti miglioramenti fanno sperare che si riuscira un giorno ad asportare tumori fino ad oggi considerati inoperabili

RESUMEN Y CONCLUSIONES

Se expone la frecuencia, clasificacion diagnostico y tratamiento de los tumores cerebrales de los niños, con referencia particular a los nuevos conceptos Las ventajas de los procedimientos quirurgicos mas radicales para ciertos tipos de tumores, particularmente meduloblastomas, se han hecho aparentes, en tanto que una actitud mas conservadora debe seguirse en otros tipos, la consideracion mas importante en este sentido es dar el mayor beneficio al paciente Al menos desde el punto de vista quirurgico debe admitirse el pronostico fatal de ciertos tumores tales como el glioma del tallo cerebral Con la mejoria tecnica ha disminuido la mortalidad quirurgica, probablemente no podra reducirse mas Con el desarrollo de dicha tecnica han sido posible las extirpaciones de lesiones antes consi adas como inopera es

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Orthodoxy . . . represents the wisdom and learning of the past, and it provides the security of that wisdom. An orthodox novelist, scientist, or doctor can be trusted to have as much learning as the last generation of his craft. That may seem a small commendation, but it is in fact one of fundamental importance, because where there is no body of orthodoxy there is no assurance to the public that the specialist in any branch of learning knows anything at all. A man may set himself up as a surgeon, a preacher, an engineer, or an architect without knowing as much of these arts as an African witchdoctor.

This is the value, in surgery, of orthodoxy, and of the machinery of examinations, degrees, and corporations that upholds it. It ensures that the surgeon does, at any rate, know something of his job. . . . Without such a guarantee the sick man is indeed in a quandary. One friend tells him to go to So-and-So, another to someone else, and he has no better reason than their opinion to guide him in his choice. He has no better reason, for nothing better exists. He has no expert knowledge himself to enable him to judge between the claims of rival hucksters, and, in the absence of orthodoxy, he would not even know where to acquire that knowledge. He is likely to be swindled by teachers as ignorant as himself. This is no fanciful picture. This was the lot of the sick man throughout the world not many years ago. It is the lot of the sick in many parts of the world today.

—*Ogilvie*

Obstetric and Gynecologic Surgery

Uterine Bleeding in Early Pregnancy

CHARLES EDWIN GALLOWAY, M.D., F.A.C.S., F.I.C.S., D.A.B.

EVANSTON, ILLINOIS

THE obstetrician is called upon to give advice and treatment for bleeding in early pregnancy more often than for any other abnormal condition. Some 28 per cent of my own patients report macroscopic bleeding in the first trimester of pregnancy. Guttmacher and Speert[1] reported the same figure (28 per cent) for 700 consecutive pregnancies, and King,[2] reporting the observations of nine different authors, said that their percentages ranged from 3.9 to 26 per cent. In 500 unselected cases of my own, 141 patients had macroscopic bleeding; 75 aborted and 425 were delivered. That means that 53 per cent of all patients with a show of blood in the first trimester will lose the embryo. It has been shown also that advanced age will increase this figure, and a history of one or more previous abortions will also place the patient in a more precarious position. It is my personal experience, based on thirty-three years of practice, that abortion in my locality is increasing, because in 1939 I prepared a report on abortion, and my rate up to then was only two-thirds of what it is now.

At present, when a patient comes for care in early pregnancy she usually has missed only one period, or two at the most, which, of course, is much better than it was twenty-five to thirty years ago. They used to walk in with the diagnosis evident as they came through the office door. In spite of more prenatal care and more advice, however, they seem to be having more abortions and just as many premature births, so that at present I tell each of them that her chance of going home from the hospital with a live baby in her arms is only about 80 per cent, and it is up to her to try to increase that percentage by following the rules of conduct and reporting at once any show of blood, regardless of the amount or the circumstances associated with it. I am quite convinced that if the current role of fetal salvage is to be increased, it will be necessary to go outside the office and the hospital and the laboratory to do it. Veterinaries get about 94 live calves for every hundred pregnancies, but, of course, no one wants his wife restricted to the pasture and the barn. Nevertheless, the difference between 80 and 94 could be decreased if each individual family would make the effort and the necessary sacrifices.

There are several encouraging statements that one can make to the patient who has been frightened by the presence of blood from the vagina. The first is that it may be a natural protective process, because the early life of an embryo in the human being is very precarious, and that if the embryo is expelled the chance of something having gone wrong in this very complicated process is about 45 per cent. In other words, about 45 per cent of all aborted embryos *should* be expelled, and,

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TABLE 1.—*Incidence of Threatened Abortion with Macroscopic Bleeding* as Reported by Various Authors*

Author	*Basis of Report*	*Incidence, %*	*Average Incidence, %*
King[2]	Experience of 9 authors	3.9 to 26	15
Guttmacher and Speert[1]	700 consecutive pregnancies		28
Galloway[5]	500 unselected cases		28.2

*More common as age advances.

TABLE 2.—*Threatened Early Abortion with Salvage of Embryo*

Author	*Basis of Report*	*Salvage of Embryo, %*
King[2]	Experience of 9 authors	67
Guttmacher and Speert[1]	700 cases	91
Galloway[5]	500 cases	85

there will be bleeding connected with the expulsion. The patient will then ask two questions: first, "If I retain the embryo and go to term, will my baby be normal?" and second, "Why should I attempt to save it if 45 per cent of miscarriages are blessings in disguise?" To her first question, concerning her baby being normal if she does go to term, one can tell her, "Yes, your baby will be normal, and, according to the study of Burge,[3] there is no evidence that treatment of threatened abortion has increased the incidence of congenital defects." To her second question one can reply that no one knows which patient will abort and that, since the incidence of success in saving the pregnancy is about 50 per cent, every effort should be made to that end. Embryos that should be expelled will be expelled regardless of treatment.

The Cervix.—Another encouraging thing that must be told the patient, if possible, is that the show of blood may be from the cervix rather than from the body of the uterus. If the uterine cervix has not been examined quite recently, one should hasten to examine it with speculum and light to make sure of the origin of the blood, especially if there is no pain and the amount of bleeding is small. In many women bleeding polyps will develop during pregnancy. I have 1 patient who has had three pregnancies, and in each a cervical polyp has developed and had to be removed. Some pregnant women will show marked hyperplasia of the cervical mucosa, especially if old lacerations are present, and this soft, adenomatous tissue will furnish some bleeding. The cervix that shows extensive erosion at the first examination may go on to bleed as the growth and weight of the uterus increase. Treatment of most erosions and polypoid proliferations of the cervical mucosa should be avoided during pregnancy if the patient is symptom free. She should be protected, however, by repeated examination of smears, and, in cases in which there is a show of blood, biopsy should be done. Carcinoma manifesting itself for the first time in early pregnancy is rare, but I have observed 3 cases, and such cases are reported in the literature quite fre-

TABLE 4.—*Macroscopic* Uterine Bleeding in Early Pregnancy: Etiologic Factors*

1.	Threatened abortion
2.	Uterine cervical lesions (polyp, decidua, adenoma, carcinoma)
3.	Trauma
4.	Ectopic pregnancy**
5.	Uterine mole
6.	Chorioepithelioma

*Microscopic bleeding, detected by smear, was reported as present in 17.6 per cent of one series of cases (Guttmacher and Speert[1]).

**Bleeding occurs in 75 per cent of cases of ectopic pregnancy.

TABLE 3.—*Data on 500 Unselected Pregnancies**

Patients with Macroscopic Bleeding Number	*Patients with Macroscopic Bleeding %*	*Abortions Number*	*Abortions %*	*Deliveries Number*	*Deliveries %*	*Abortions in Patients with Bleeding %*	*Patients Requiring Transfusion Number*
141	28.2	75	15	425	85	53	3

*All of the women in this group were private patients
The incidence of abortion is apparently increasing

quently. Although this presentation does not concern the treatment of carcinoma, early diagnosis is just as important during pregnancy as at any other time, and the most important sign or symptom is bleeding.

Another rather rare condition that causes bleeding in early pregnancy is maldevelopment of the birth canal resulting in such anomalies as vaginal septum, double cervix and bicornuate uterus. I reported 6 cases in 1937, in 3 of which the patients had bleeding in the first trimester.

Trauma. — If any cervical lesion is present and trauma from intercourse occurs, the set-up for a show of blood is ideal. Here again the human being comes in with a predisposing factor, namely, intercourse after conception. This, coupled with the fact that human beings are up on their hind legs, riding, traveling, drinking and smoking to excess and driving themselves to utter exhaustion, leads to more bleeding in pregnancy and a higher fetal loss than that of other animals. Without proper guidance and education, the little hypoplastic girl with a retroverted uterus marries some vigorous athlete who insists on making intercourse into a virtual wrestling match, and all the laboratories, hospitals and certified specialists have no power to alter the situation.

Ectopic Pregnancy.—About 75 per cent of all ectopic pregnancies cause bleeding *per vaginam*. The blood is generally darker than that due to other causes, and, if one looks carefully and examines the material in the vagina, decidual fragments may be found. Most of the bleeding is decidual in origin. Progressive ischemia eventually produces necrosis and slough with bleeding. It is quite necessary to examine any tissue passed by placing it under the microscope. I have had 2 patients who passed uterine casts or molds and in whom the tubal pregnancy ruptured at just about the time when the report on the tissue came through. These casts resemble collapsed sacs, and one should never be too sure of the diagnosis of uterine abortion. Bleeding from the tube down through the uterine canal is regarded as rare. If the patient says she started bleeding one week late and the bleeding is not normal, one should be alerted and ask for close cooperation for at least two months, with repeated examinations. Adnexal tenderness is helpful in the early diagnosis, but pain is not to be waited for.

Mole.—Hydatidiform degeneration *begins about the fifth week of pregnancy*. Hertig and Edmonds examined 1,027 spontaneously aborted ova and observed hydatidiform degeneration in 40 per cent. About 47 per cent of the ova in their series of spontaneous abortions were pathologic, and of these 66.9 per cent showed hydatidiform degeneration. Mole is a type of missed abortion. It generally induces a more rapid growth than normal, and the size of the uterus increases horizontally as well as vertically. At the time of examination, bilateral ovarian cysts may be detectable by palpation. In the cases I have observed every one of the patients had a rapid pulse. A normal roentgenogram showing a uterus of sufficient size may

help with the diagnosis. At least half of the patients will abort spontaneously, but such abortions must all be followed by repeated curettage and a long, close follow-up. Anemia is generally severe and should be treated by transfusion if necessary.

Choriocpithelioma.—So far in my practice I have encountered only 2 cases of chorioepithelioma, and 1 of the patients is living and well seventeen years later. I removed a fairly large metastatic growth near the external meatus of the urethra and did a radical hysterectomy, including both ovaries and tubes. Whenever this subject arises I generally turn the meeting over to the medical students, because for some strange reason they know more about this very rare condition than do even the interns! One of the most important steps in trying to prevent it is to perform a thorough curettage after every complete or incomplete abortion. I will not treat threatened or actual abortion and permit the patient to stay at home.

Treatment of Uterine Bleeding in Early Pregnancy. — First of all one wishes to know, if possible, where the bleeding originates. If its origin is cervical, treat the cervix. Remove the polyps; coagulate raw bleeding erosions, either with the electric current or with chemicals, and repeat the treatment if necessary. A carcinomatous uterus is to be treated even more carefully and thoroughly than a nonpregnant one; the fetus should be disregarded.

If the bleeding is from the uterus, rectal or vaginal examination is done to ascertain whether or not the lower uterine segment is dilated, the angle of the cervix changing, the cervix opening or the uterus irritable to palpation or there are clots in the vagina. If none of these conditions exists, the patient is told to stay in bed at least three days; to use a pan, so that nothing will be washed down the toilet; to save all pads and clots, and to telephone if any of her symptoms increase or cramps set in. I like to use both estrogen and progesterone in fairly good-sized doses (5 to 10 mg.) every eight hours. If the symptoms increase or are already severe, the patient is told to go to the hospital and expect to remain there until the case is settled one way or the other. The amount of blood lost is always considered in correlation with the duration of the pregnancy and the size of the uterus. A small uterus bleeding moderately calls for evacuation of its contents earlier than does a fairly large uterus that is bleeding about the same amount. The larger the uterus, the longer one can wait before going in, and if possible one should wait until the sac can be palpated in the cervical canal. The

TABLE 5.—*Uterine Bleeding Due to Ectopic Pregnancy, Mole and Choriocpithelioma*[a]

	Ectopic Pregnancy	*Mole*	*Choriocpithelioma*
Cause	Progressive ischemia producing decidual necrosis*	"Missed abortion"	Retroversion, procidentia, erosion, polyp, coitus
Signs and Symptoms	Decidual fragments; passage of decidual casts; abnormal flow one week late	Early rapid growth of uterus, horizontal as well as vertical; rapid pulse; anemia; toxicity; pain	
Prophylaxis and Management	Look EARLY for decidual fragments	Examine for bilateral ovarian cysts; obtain normal roentgenogram of uterus of sufficient size	Curet thoroughly after every abortion (*truncate bleeding*)

[a] The author's experience with early uterine bleeding due to choriepithelioma is limited to 2 cases. One of the patients is still living.

patient deserves to have the uterus emptied before an ascending intrauterine infection sets in, exposing her to possible sterilization I have never yet emptied a uterus but that I was glad it was done, but there have been cases in which I was distressed to think I had waited so long There are also cases in which the loss of blood in relation to the size of the uterus is tremendous and rapid and calls for transfusion administered as quickly as possible In the series reported here, 3 of 75 of the patients who aborted required transfusions

SUMMARY

Bleeding in early pregnancy calls for thorough differential diagnosis before treatment This includes consideration of such cervical lesions as polyps, erosions and carcinoma One must also consider ectopic pregnancy, hydatid mole, chorioepithelioma and various developmental abnormalities, such as bicornuate uterus, double cervix and vaginal septum

RESUMEN

La hemorragia de principios del embarazo requiere un diagnostico diferencial antes que una terapeutica Esto incluye la consideracion de lesiones cervicales tales como pólipos, erosiones y carcinoma Tambien se debe considerar el embarazo ectopico, la mola hidatiforme, el corio epithelioma y diversas anomalias de desarrollo tales como utero bicorneo, cervix doble y septo vaginal

SUMARIO

A perda de sangue no inicio da gravidez exige um diagnostico diferencial completo antes do tratamento Isso inclui a consideração de lesões cervicais tais como polipos, erosões e carcinomas Deve se tambem considerar a gravidez ectopoica, mola hidatide, corioepithelioma e varias anormalidades de desenvolvimento, tais como utero bicornato, cervix duplo e septo vaginal

RESUME

L'hemorragie au debut de la grossesse necessite un diagnostic differentiel approfondi avant tout traitement Il en est de meme pour les lesions cervicales telles que les polypes, les erosions et le carcinome Il faut encore prendre en consideration la grossesse ectopique, la môle hydatiforme, le chorio epithelome, et diverses anomalies du developpement telles l'uterus bicorne, le double col et le septum vaginal

RIASSUNTO

Le perdite ematiche dai genitali nei primi periodi della gravidanza rendono necessaria un'accurata diagnosi differenziale primi di procedere alla cura Debbono essere ricercate eventuali lesioni cervicali (polipi, erosioni, carcinomi), gravidanze ectopiche, mole idatidee, chorioepitheliomi e anomalie di sviluppo (vagina septa, duplicita del collo, utero bicorne, ecc)

ZUSAMMENFASSUNG

Blutungen im fruhen Stadium der Schwangerschaft erfordern sorgfaltige differentialdiagnostische Studien vor Einleitung der Behandlung Zu berucksichtigen sind Erkrankungen des Gebarmutterhalses wie Polypen, Erosionen und Karzinom Ferner muss an ektopische Schwangerschaft, Blasenmole, Chorionepitheliom und an verschiedene angeborene Anomalien wie zweihorniger Uterus, Verdoppelung des Gebarmutterhalses und Scheidenseptum gedacht werden

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Traumatic Rupture of the Uterus in Early Pregnancy

VIRGIL McCARTY, M.D., F.A.C.S., F.I.C.S.
PRINCETON, INDIANA,
AND
DONALD R. RISLEY, M.D.
MT. CARMEL ILLINOIS

MANY articles have appeared on the subject of the ruptured uterus. With few exceptions these have dealt with rupture of the pregnant uterus during labor in a woman who had undergone one or more abdominal sections. Relatively few cases of traumatic rupture of the pregnant uterus have been reported, and, with few exceptions, the trauma resulted from difficult instrumental delivery or internal version.

It is indeed surprising, in this day of high speed automotive travel, not to encounter more reports of traumatic rupture of the pregnant uterus. In a survey of the literature, we did not encounter a single reported case in which the patient was under three months pregnant and had a ruptured uterus due to external trauma in an automobile accident.

REPORT OF CASE

A 22-year-old white woman, para 0, gravida 2, whose most recent menstrual period had begun on June 27, 1955, was brought to the emergency room of the Wabash General Hospital at Mt. Carmel at approximately 7 p.m. on September 12. About thirty or forty minutes prior to arrival she was a rear seat passenger in an automobile involved in a front-to-side collision. Two deaths occurred in this accident.

Preliminary examination revealed a 16 cm. laceration of the scalp, bleeding profusely; complete fracture of the right humerus, with gross deformity; tenderness in the lower part of the abdomen; lacerations and contusions, and probable fracture of the pelvis. On arrival the blood pressure in millimeters of mercury was 75 systolic and 80 diastolic, and the pulse rate was 130. Antishock measures, together with administration of oxygen and blood transfusions from the hospital blood bank, were immediately carried out. Before the transfusion of the first unit of blood had been completed the blood pressure dropped to 41 systolic and 0 diastolic and the pulse rose to 140. Whole blood was then administered under pressure. At the end of administration of 1,000 cc. of blood the pressure was 95 systolic and 60 diastolic and the pulse rate was 110. At this time, approximately one and one-half hours after her arrival, the patient was moved across the hall from the emergency room to the roentgen room for further examination. In spite of continued administration of blood under pressure, the slight trauma induced by roentgen examination caused the pressure to drop to 75 systolic and 30 diastolic.

Wet films of the pelvis revealed multiple fractures of the four rami and the symphysis, as well as a crushed fracture dislocation of the Malgaigne type at the right sacroiliac joint. A complete long spiral fracture of the midshaft of the right humerus was also noted.

It was then evident that a severe intra-abdominal hemorrhage had occurred. The abdomen was more tender, and more rigidity had developed. A catheterized specimen of the urine showed no gross blood. The leukocyte count, two hours after the injury, was 16,000 per cubic millimeter of blood. Continued transfusion of blood was given under pressure, and the patient was removed to the operating room.

Endotracheal nitrous oxide-ether anesthesia was employed. The abdomen was opened through a low midline incision. Rupture of the uterus had not been considered preoperatively, but it was the impression that the site

[illegible]

of the hemorrhage was probably in the pelvic area

When the peritoneum was opened, a large quantity of blood was present Exploration soon revealed the site of hemorrhage Fetal parts and fragments of placenta were scattered throughout the abdomen There was a 4 cm transverse rent in the anterior uterine wall at the junctuie of the lower uterine segment and the middle third of the uterus The major portion of the placenta was removed manually, and the remaining bits were removed by curet Although it is customary to perform hysterectomy for a ruptured uterus, we elected to suture this one The laceration in the uterus was closed with No 0 and No 00 chromic sutures Two Penrose drains were placed in the cul-de-sac of the pelvis and were brought out through the lower end of the wound The abdomen was closed in layers with No 0 chromic sutures for the peritoneum, No 00 surgical cotton for the fascia, No 00 plain for the subcutaneous tissues and No 00 dermal for the skin

The laceration of the scalp was sutured, and the fracture of the humerus was treated by traction for three and one-half weeks after which a long-arm plaster cast was applied Twenty pounds (9 1 Kg) of traction with a Steinman pin through the lower part of the tibia was initially used Two half-screw pins were placed through the lateral aspect of the proximal femur at the trochanteric level into the neck and head of the right femur for lateral traction, with a weight of 8 pounds (3 6 Kg). Ten pounds (4 5 Kg) of traction was applied by using Buck's extension on the left leg to balance the pelvis

Convalescence was satisfactory Bedside roentgenograms were taken from time to time, and traction was gradually reduced over a period of eight weeks Active muscle exercises were maintained during the period of immobilization in traction The patient was dismissed from the hospital on Nov 14, 1955 walking on crutches Seven and one-half months after injury with routine physical therapy, she returned to her work as a secretary She walked well, her limp being barely noticeable

CONCLUSIONS

1. A case is reported of traumatic rupture of the uterus in a patient approximately two and one-half to three months

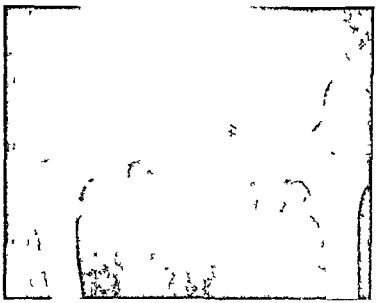

Fig 1 —Initial roentgenogram, taken on admission, Sept 12, 1955

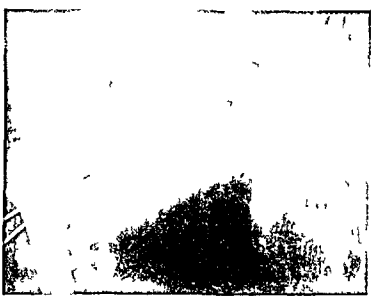

Fig 2 —Roentgenogram taken one month later, during treatment in traction

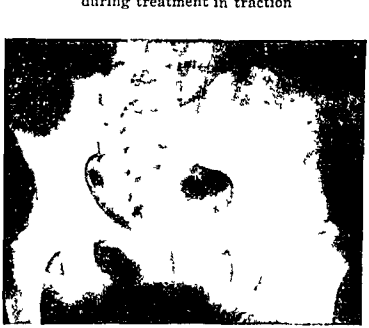

Fig 3 —Roentgenogram of patient ambulatory on crutches five months after the injury.

pregnant. The trauma resulted from external violence in an automobile accident. In the author's opinion this is rare.

2. In cases of multiple fracture and multiple obvious injuries it is imperative to suspect intra-abdominal hemorrhage if the initial shock does not readily respond to the usual measures.

3. Early exploration of the abdomen is recommended. It is probably not advisable to wait for the patient to be in optimal condition.

RÉSUMÉ

1. L'auteur rapporte un cas de rupture traumatique de l'utérus (accident d'automobile) chez une femme enceinte de deux mois et demi à trois mois.

2. Dans les cas de fractures multiples et de lésions multiples évidentes il faut toujours suspecter une hémorragie intra-abdominale lorsque le choc initial n'est pas influencé par les mesures usuelles.

3. Une exploration précoce de l'abdomen est recommandée. Il n'est sans doute pas à recommander d'attendre que la malade se trouve dans un état optimum.

SUMARIO

1. Um caso de rutura traumática do útero em uma paciente grávida de aproximadadente 2 e meio a meses é relatado. O trauma resultou de violência externa em um acidente de automóvel. Na opinião do autor. é raro.

2. Em casos de fraturas múltiplas e inúmeras lesões óbvias torna-se imperativo suspeitar de hemorragia intra-abdominal, se o choque inicial não responder prontamente às medidas usuais.

3. A exploração precoce do abdome é recomendada. Provàvelmente não é aconselhável se esperar que o paciente fique em condição ótima.

RIASSUNTO

1. Viene riferito un caso di rottura traumatica dell-utero in una donna gravida circa tre mesi. Il trauma si produsse durante un incidente automobilistico.

2. Quando ci si trova in presenza di fratture multiple e di lesioni varie è indispensabile sospettare unaemorragia intraddominale se lo shock iniziale non si risolve dopo i comuni provvedimenti.

3. Si raccomanda una esplorazione precoce dell'addome, mentre non è consigliabile attendere che le condizioni del paziente migliorino.

RESUMEN

1. Se comunica el caso de una ruptura uterina traumática en un paciente de dos y medio a tres meses de embarazo. El trauma se produjo por un accidente automovilistico. Según el autor es un caso raro.

2. En los casos de fracturas y lesiones múltiples es importante sospechar una hemorragia intra abdominal si el choque inicial no responde a los medios terapeúticos habituales.

3. Se recomienda la exploración precoz del abdomen. Probablemente no es aconsejable esperar a que el paciente se ponga en condiciones óptimas.

ZUSAMMENFASSUNG

1. Es wird über einen Fall von traumatischem Gebärmutterriss bei einer Patientin berichtet, die etwa zweieinhalf bis drei Monate schwanger war. Die Verletzung kam durch äussere Gewalteinwirkung in einem Kraftfahrzegunfall zustande, was der Verfasser für ein seltenes Vorkommnis hält.

2. In Fällen von mehrfachen Knochenbrüchen und mehrfachen auffälligen Verletzungen darf man unter keinen Umständen die Möglichkeit von Blutungen innerhalb des Bauches unberücksichtigt

lassen, wenn der anfangliche Schock auf die ublichen Massnahmen nicht sofort anspricht

3 Fruhzeitige Probelaparotomie wird empfohlen Es ist wahrscheinlich nicht ratsam, zu lange Darauf zu warten, dass der Kranke einen optimalen Zustand erreicht

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The Clinical Aspects of Dupuytren's Contracture

TIMOTHY A. LAMPHIER, M.D., F.A.C.S., F.I.C.S., D.A.B.
BOSTON, MASSACHUSETTS
WILLIAM WICKMAN, M.D., A.I.C.S.
MIAMI, FLORIDA
JOHN COVINO, M.D., A.I.C.S.
CAMBRIDGE, MASSACHUSETTS
AND
N. GILMOOR LONG, M.D., F.I.C.S.
CHICAGO, ILLINOIS

THE hand is subject to many interesting diseases, but one of its most fascinating is Dupuytren's contracture. This condition was first described in 1831 by Dupuytren, a French surgeon after whom the disease was justly named. Its essential description has not been altered appreciably since that time. It consists mainly of a flexion contracture of either hand, usually localized to the ring and little fingers, although it may include the long and index fingers in some advanced cases. The contracture is due to a fibrosing process of the palmar fascia of the hand, characterized by the formation of taut contracture bands underneath the skin of the palm and proximal to the fingers involved. Usually a fibrous nodule in the palm in line with the ring finger is pathognomonic.

In this paper we shall review the clinical aspects of Dupuytren's contracture and draw certain conclusions based on the analysis of some 40 cases in which we have had occasion to observe and treat it.

For a full appreciation of the distinctive characteristics of this disease, a comprehensive understanding of the normal anatomic character of the palmar fascia is necessary. We have referred to both Cunningham's *Anatomy*[1] and to the *Surgical Anatomy of the Hand*, by Dr. Emanuel B. Kaplan,[2] for the following description.

The Palmar Fascia: Anatomic Aspects.—In the center of the palm is the palmar fascia, a thick triangular membrane, the apex of which merges proximally with the distal edge of the transverse carpal ligament and more superficially receives the insertion of the tendon of the palmaris longus muscle. Distally the fascia divides into four longitudinal bands, the so-called pretendinous bands, one for each finger. These bands are interconnected on their deep surfaces by transverse fibers that cover the lumbrical muscles and the digital vessels and nerves. The pretendinous bands extend distally and become firmly adherent to the fibrous sheaths of the flexor tendons of the four fingers. Continuation of the longitudinal bands into the anterolateral sides of the fingers is observed mainly in the pathologic fasciae associated with Dupuytren's contracture.

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The lateral borders of the triangular central portion of the palmar fascia are continuous with thin layers of deep fascia, which cover and envelop the muscles of the thenar and hypothenar eminences.

The superficial transverse ligament of the fingers is a thin band of transverse fasciculi: it stretches across the roots of the four fingers and is closely attached to the skin of the clefts and, medially, to the fifth metacarpal bone, forming a kind of rudimentary web. Beneath it, the digital vessels and nerves pass to their destinations.[3] Along the entire length of the pretendinous bands, short fibers extend into the deep surfaces of the skin. These fibers are particularly well developed over the metacarpophalangeal joint areas. When the fingers are hyperextended, the pretendinous bands become taut and depress the skin along the flexor tendons over the metacarpal heads in the distal part of the hand. At the same time, with the depression produced by the pretendinous bands, slight elevations appear between the depressed areas. These elevations are caused by the intervening fat pads in the distal parts of the intermetacarpal spaces. The anatomy of the palmar aponeurosis shows how extensive its attachments are. Therefore, involvement by a pathologic condition, such as Dupuytren's contracture, may cause far-reaching deformities of the hand. The dimpling and puckering of the skin observed in advanced stages of this condition is due to involvement of the septal fibers between the superficial fascial stratum and the skin.

Kanavel[4] stated that "the fascia of the hand is divided into four parts: (1) superficial palmar fascia; (2) volar interosseous fascia; (3) digital fascia; and (4) dorsal fascia. The superficial palmar fascia is described as the *palmar aponeurosis*. It has superficial, longitudinal and deeper transverse fibers; it is divided into four distinct longitudinal bands, inserted chiefly into deep layers of the skin just proximal to webs of the fingers. Many short vertical and oblique fibers are arranged in definite longitudinal lines, uniting the fascia to the deeper layers of the skin. The thin layer of fascia covering the interdigital spaces overlying the digital nerves and vessels as they become superficial is a direct continuation of the central portion of the palmar aponeurosis. Of equal importance from the surgical standpoint are the volar interosseous fascia, the digital fascia and the septa which unite them.

Three important longitudinal septa unite the superficial palmar fascia with the volar interosseous fascia. The medial septum, attached deeply to the transverse carpal ligament above and to the fifth metacarpal bone distally, separates the flexion tunnel from the muscles of the hypothenar eminence. A lateral septum attached deeply to the first and second metacarpal bones lateral to the flexor tendons of the index finger.

The middle septum, passing deeply between the flexor tendons of the index and middle fingers to the middle metacarpal bone, divides the space between the medial and lateral septa into two definite fascial compartments—the middle palmar space and the thenar space.

As the septa that form the lateral walls of the flexor tunnels separate from one another, they increase in thickness and distally gain an attachment to the transverse metacarpal ligament, the capsules of the metacarpophalangeal joints and the lateral aspects of the proximal phalanges.

Etiologic Factors.—There is as yet no definitely established cause for this disease. Among the causes that have been suspected but ruled out over the past hundred years are congenital syphilis, dysfunction of the thyroid, arteriosclerosis, chronic specific or nonspecific inflammation, focal infections, arthritis, gout, diabetes mellitus, coronary artery disease, scleroderma, vita-

min E deficiency and endocrine disturbances. Contributing factors that seem to have some importance in the causation of the disease are heredity, aging, constitutional predisposition and trauma.

In every large series of cases one observes that heredity plays a contributing role. Several cases in every series seem to have a familial incidence. Sumnar Koch[1] has emphasized the importance of the hereditary factor. Glaubard,[2] on the other hand, after an extensive etiologic study failed to find any significant evidence of hereditary tendency.

Dupuytren's contracture is a disease of middle life and old age. Aging appears to be a definite contributing factor in its causation. From our observation, it is rather unusual to encounter this disease in a person below the age of 40 years. A review of our series and other series of cases shows that the highest incidence occurs during and after middle life and afterward. There is also a notable difference in the sex ratio, the condition occurring in the male about six to seven times as often as in the female.

The coexistence of Dupuytren's contracture and Peyronie's disease of the penis in some cases has suggested to some authors a constitutional predisposition to fibroblastic changes in certain areas of the body. Peyronie's disease is a contracture of the connective tissue septum between the corpus cavernosum and the corpus spongiosum. Occasionally, Dupuytren's contracture occurs in the foot.

Trauma as an important contributing [illegible]

The most outstanding pathologic change is the proliferation or hyperplasia of the connective tissue in the palmar aponeurosis. It may be stationary or progressive. The final stage in this process is the presence of scar tissue, with its characteristic shortening and contraction. Distinct bands form. The fingers involved, in the order of frequency, are the ring finger, the little finger and the long (middle) finger—rarely the index finger. The most frequent region primarily affected is the palmar aspect of the metacarpophalangeal joint of the ring finger. The earliest change noted is the occurrence of a small subcutaneous nodule at the base of the ring or little finger; soon afterward one may observe a slight dimpling or puckering of the palmar skin in the same area. Flexion contractures or linear bands affecting these fingers may develop over varying periods, ranging from several months to several years. This flexion contracture occurs at the metacarpophalangeal joint first and then at the proximal interphalangeal joints, while the distal joint is maintained in complete extension or is never affected. The contracture appears as a thickened cord or band extending from the concavity of the palm as far as to the proximal interphalangeal joint of the affected finger. It rarely involves the tendon. Within a lapse of time ranging from months to several years, other fingers may become involved by the same scarlike process, and flexion contracture bands result. It is important to emphasize the fact that examination of the tendons of the involved fingers and their joints reveal them to be perfectly normal in their motion except in the far advanced stages of the disease. They are also free of other pathologic changes except [illegible]

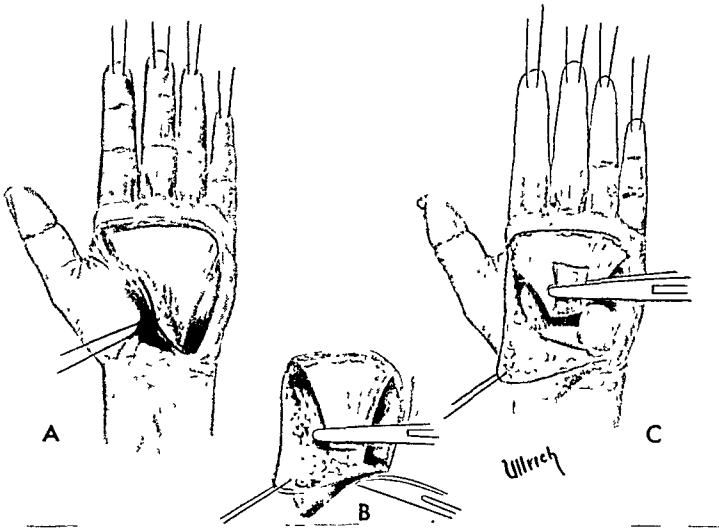

FIG. 1.—*A*, elevation of palmar flap to provide adequate exposure of entire palmar fascia. Incision is made along the linear mensalis, because at this level the palmar fascia divides just distal to it. *B* and *C*, division of palmar fascia just distal to transverse carpal ligament. Neurovascular bundles, enclosed between two layers of fascia to proximal phalanx, must be carefully protected in dissection.

permanent flexion contractures regardless of treatment.

Dupuytren's contracture is a self-limiting disease. Absence of normal adipose tissue separating skin and fascia is pathognomonic of this condition.

Microscopic studies of the skin overlying the affected palmar aponeurosis will show definite pathologic changes. Hypertrophy and keratinization of the epidermis, a fibrotic corium and atrophied papillae. As has been stated, the connective tissue elements of the palmar aponeurosis show hyperplasia and proliferation. In certain areas there are similarities to the pathologic picture of a keloid or a fascial dermoid. This fascial involvement is not limited to the superficial palmar aponeurosis but involves the fibers communicating between the fascia and the skin, and the process may even extend into the dorsal fascia. The latter pathologic extension explains the occasional occurrence of dorsal knuckle pads or the formation of nodules on the dorsum of the fingers in Dupuytren's disease.

Microscopic examination of the skin and subcutaneous tissue in a case of well-developed contraction shows decided thickening of the corneal layer of the epidermis, flattening of the deeper layers, gradual disappearance of the papillae of the corium and substitution of thick fibrous tissue for the normal reticular layer of the corium, from which the fat and glands eventually disappear completely and in

which the blood vessels are considerably diminished.

As the disease progresses, the muscles become atrophic with ankylosis and joint contracture. No success can be expected in cases of long-standing and neglected contracture.

Dupuytren's contracture may be progressive or stationary.

Differential Diagnosis.—There is usually no difficulty in making the diagnosis of Dupuytren's contracture. The patient presents himself or herself with a painless deformity of the palm. Physical examination shows an elevated contracted ridge-like band, visible and palpable under the skin of the palm and extending from the base of the little, ring or middle finger proximally to the tendon of the palmaris longus. Pain is not common. The skin at the base of the third, fourth and fifth fingers may be so involved by attachment to the underlying palmar aponeurosis that one may observe dimpling or puckering of the skin in these areas. Each involved finger is flexed at the metacarpophalangeal joint, but the interphalangeal joints are free and mobile, more frequently the ring finger.

A careful distinction must be made between Dupuytren's contracture and fibrosarcoma. Dupuytren's contracture must also be differentiated from other types of contracture that may involve the fingers. One must consider particularly, for example, contracture of the flexor tendon of a finger due to injury or previous infection. The history becomes important, as one can usually elicit an account of injury or severe infection that would explain this type

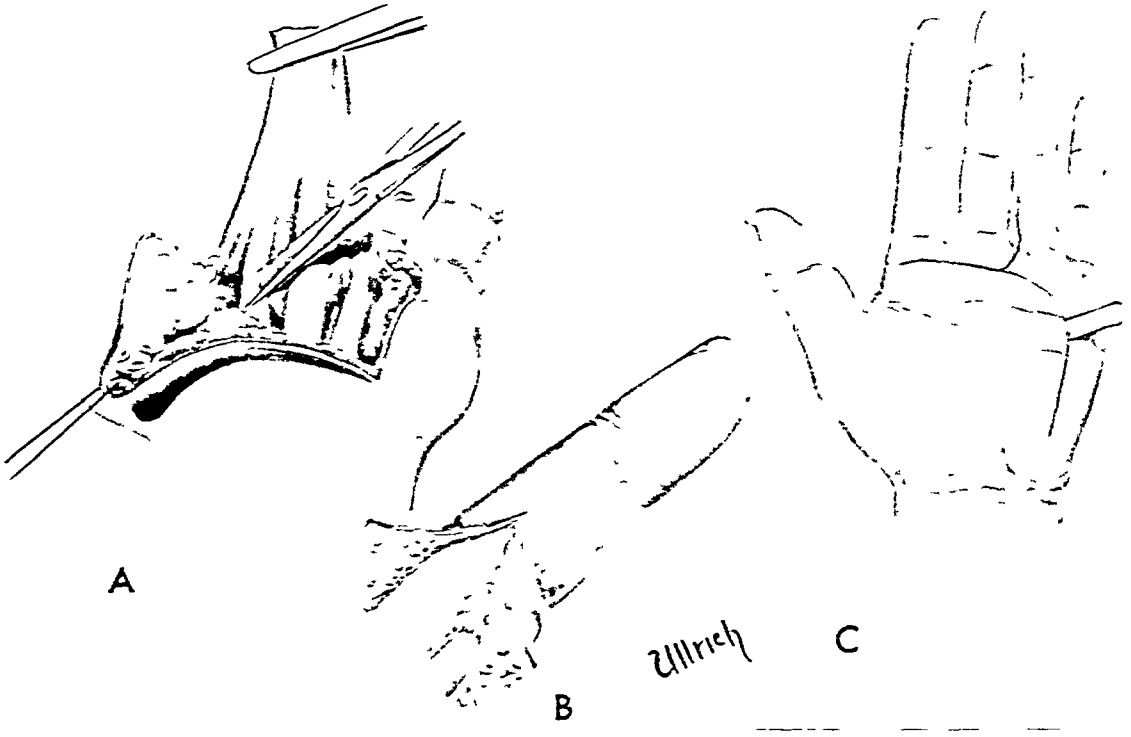

Fig. 2.—*A*, total excision, not only of palmar "plate" but of vertical extension to metacarpals. *B*, anterolateral extension of palmar incision in dissecting fascia of fingers when they are involved. *C*, completed procedure, showing small Penrose drain in place.

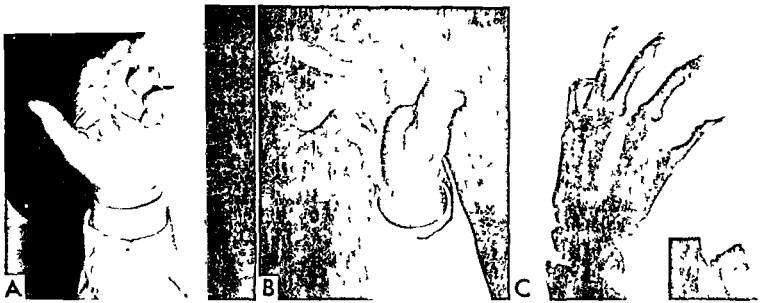

Fig 3.—*A* and *B*, photographs of the hands of a well-known columnist, demonstrating bilateral Dupuytren's contracture with irreparable joint changes *C*, roentgenogram showing actual joint changes that have taken place in the hand.

of contracture. Since the contracture is due usually to involvement of the flexor tendon, one observes that the pathologic site is deeper in the palm and that the contracture does not form as prominent a band as in Dupuytren's disease. Also there does not appear to be the same adherence of the skin to the underlying tissues as is noted in cases of Dupuytren's contracture. With contractures due to injury or infection one observes also that the interphalangeal joints are more restricted than by Dupuytren's contracture and that pain is caused by forced motion of these joints

An adequate history is necessary to rule out the congenital and the spastic contractures. Another distinguishing pathognomonic feature is that if the contracture is congenital or spastic one can extend the fingers by flexing the wrist, since this movement produces relaxation of the long flexor tendons, the structures primarily involved in such contractures. By the same token, flexion of the wrist does not permit extension of the fingers involved in Dupuytren's contracture, since this movement does not relax the contracted palmar aponeurosis. One fails to note dimpling and puckering of the skin and superficial raised thick cords in cases of either the congenital or the spastic type of contracture.

Treatment.—Various types of treatment have been attempted for the cure of Dupuytren's contracture, with varying degrees of success. The only treatment that has stood the test of time, however, is surgical removal of the thickened and contracted palmar aponeurotic sheath. Subcutaneous fasciotomy is dangerous, because of the possible injury to underlying nerves and blood vessels, and the recurrence rate is high. The best exposure seems to be obtained with a reversed L type of incision, the horizontal limb of the L extending through the skin in a transverse direction and following the crease in the skin formed by the flexion of the little, ring and middle fingers. The vertical limb of the L extends on the ulnar side of the palmar skin along the fifth metacarpal bone. An anterolateral incision is used in dissecting the fascia of the fingers. This incision is made along the linea mensalis, because at this level the palmar fascia divides just distal to it, thus there is excellent exposure.[7]

Meticulous preoperative preparation of the involved hand is extremely important for a successful result. The hand should be washed thoroughly several times with phisoderm, and a dry sterile dressing

should be applied to the hand the night before the operation.

During the operation, asepsis, a bloodless field obtained with the aid of a pneumatic tourniquet, meticulous hemostasis and a minimal amount of crushing trauma or careless wiping of the tissues, are all factors that contribute to a successful outcome.

Procaine hydrochloride with epinephrine should never be used; it may cause prolonged spasm of blood vessels and ultimate gangrene.

If the skin is so completely involved that undermining it or separating it from the underlying aponeurosis would jeopardize its blood supply, it is far wiser to excise this portion of involved skin completely and replace it in the resulting defect with full thickness (Wolff) skin graft at the completion of the reconstructive stage, avoiding buttonholing of the skin flaps. As Adams[8] stated, the best donor site is the inner aspect of the upper arm, and the suture should be left in place for three weeks.

With complete exposure of the palmar aponeurosis, the attachment of the aponeurosis at its origin from the transverse carpal ligament is severed. The fascia laterally along the border of the thenar eminence and medially along the hypothenar eminence is incised, which further mobilizes the aponeurosis. Dissection of the aponeurosis downward and distally is accomplished by means of a sharp scalpel, the fasciculi being divided as they pass in various directions. The thickened cords and the fascia, extending into the proximal phalanges of the affected digits are carefully excised. It is at this point at the base of the fingers that special care must be taken to protect the digital nerves and vessels, as they lie just underneath the contracted fascia and their digital extensions. After completion of this stage, the tourniquet is released temporarily; meticulous hemostasis is secured, and careful attention is given to closure of the skin. Antibiotics are ordered routinely. A drain is essential to prevent devitalization of the skin flaps. This drain can be removed with long black silk thread a day or two after the operation. There is need for tying off vessels and releasing the pneumatic cuff prior to skin closure.

The skin is approximated very carefully with fine interrupted silk sutures and a well-padded pressure dressing is applied, the fingers being maintained in slight flexion. This dressing is allowed to remain in place for at least ten days. Then the use of a Mason splint, after the initial change of dressing, or dorsal splint plus guarded active and passive motion, is started. Whirlpool hand baths, massage, physiotherapy and exercises with a sponge rubber ball are prescribed. With this therapy, it is to be expected that within four to six weeks fairly normal function of the previously involved fingers can be attained. It is advisable for the patient to wear an appropriate guarding splint (Mason splint) at bedtime during the first four postoperative weeks. One must be careful not to remove the skin sutures too early, because premature separation of the incision will prolong healing, invite infection and scarring, and in this manner jeopardize a successful result. Healing of the skin is necessarily slow, delayed and prolonged. Such maneuvers as filleting a completely damaged finger and using the skin as a whole thickness graft is a useful maneuver.

Hutchinson's operation, which consists of excising the head of the proximal phalanx and shortening the extensor tendon through a dorsal incision, is not used.

Dorsal splints are advantageous during sleep and while resting. Wolff grafts, when necessary, should be applied at once. Digital skin exposure may be provided by bayonet extension of the original incision.

SUMMARY AND CONCLUSIONS

1. The cause of Dupuytren's contracture is still unknown. Certain contributing factors may be important and are discussed.

2. Surgical intervention appears still to be the best form of treatment. It consists of complete removal by excision of all of the involved palmar fascia and all of its attachments to (a) the skin, (b) the phalanges (c) the metacarpal bones (d) the interfascial septa and (e) the volar interosseous fascia.

3. An aseptic technic, a bloodless field, careful hemostasis, a minimum of tissue trauma and careful skin closure are emphasized as important factors for a successful result.

4. The importance of careful postoperative treatment is discussed.

5. An analysis of some 40 cases is included, and certain conclusions derived are discussed A review of the cases of 35 male and 5 female patients is included. The average age was 46 years. The functional results were excellent in 34 instances, good in 4 and poor in 2. In 6 patients the condition was bilateral.

RÉSUMÉ ET CONCLUSIONS

1. La cause de la maladie de Dupuytren est encore inconnue. Certains facteurs qui pourraient être prédisposants sont discutés.

2. L'intervention chirurgicale semble bien être encore la meilleure forme de traitement. Elle consiste en l'ablation par excision de tous les fascia palmaires et de toutes, les adhérences a) à la peau, b) aux phalanges, c) aux os métacarpiens, d) à toutes les aponévroses interfasciales, et d) à toutes les aponévroses palmaires interosseuses.

3. Les conditions essentielles d'un bon r'sultat sont les suivantes: technique aseptique, champ opératoire ischémié, hémostase prudente, minimum de tissu traumatisé, et suture soigneuse de la peau.

4. L'importance du traitement postopératoire est exposée.

5. Une analyse d'une quarantaine de cas est présentée (35 cas chez l'homme, de 5 cas chez la femme; âge moyen: 46 ans). Les résultats fonctionnels ont été excellents dans 34 cas, bons dans 4 cas, médiocres dans 2 cas. Dans six cas l'affection était bilatérale.

CONCLUSIONI RIASSUNTIVE

1. La causa della contrattura di Dupuytren è ancora ignota. Vengono discussi alcuni fattori concausali che potrebbero avere importanza.

2. L'intervento chirurgico è ancora la miglior forma di trattamento. Esso consiste nella completa rimozione della fascia palmare interessata e di tutte le sue inserzioni alla cute, alle falangi, alle ossa del metacarpo, ai setti interfasciali e alla fascia volare interossea.

3. Un importante fattore di successo è rappresentato da una tecnica corretta, asettica, esangue, non traumatica per i tessuti e con una accurata chiusura della cute.

4. Anche il trattamento postoperatorio ha la sua importanza.

5. Vengono riferiti i risultati su 40 casi operati. Si trattava di 35 maschi e 5 femmine, di 46 anni di età in media, in cui si ebbero 34 risultati buoni dal punto di vista funzionale, 4 discreti e 2 cattivi. In 6 malati la affezione era bilaterale.

SUMARIO E CONCLUSOES

1. A causa de contratura de Pupuytren é ainda desconhecida. Certos fatores contribuintes podem ser importantes e são discutidos.

2. A intervenção cirúrgica parece ser ainda a melhor forma de tratamento. Consiste na remoção completa, por excisão, de todo o fascia palmar involvido e to

seus ligamentes (a) à pele, (b) às falanges, (c) aos ossos metacarpos, (d) aos septos interfasciais e (e) ao fascia interosseo volar.

3. Uma técnica asséptica, um campo exangue, hemostasia cuidadosa, um mínimo de trauma do tecido e cuidadoso fechamento da pele são fatores cuja importância é salientada para se obter um resultado satisfatório.

4. A importância de cuidadoso tratamento pós operatório é discutida.

5. Uma análise de 40 casos é incluida e certas conclusões alcançadas e discutidas. Uma revisão dos casos de 35 pacientes do sexo masculino e 5 do sexo feminine é incluida. A idade média foi 46 anos. Os resultados foram funcionais em 34 casos, bons em 4 e pobres em 2. Em 6 casos a condição era bilateral.

RESUMEN

1. La causa de la contractura de Dupuytren aún se desconoce. Se discuten ciertos factores coadyuvantes que pueden ser de importancia.

2. Todavía parece que la intervención quirúrgica es la mejor terapeútica. Consiste en la extirpación completa de toda la fascia palmar con sus inserciones a (a) la piel, (b) a las falanges, (c) a los metacarpianos, (d) a los tabiques interfasciales y (e) a la fascia palamar interósea.

3. Se señalan como factores importantes para el éxito, la técnica aséptica, una cuidadosa hemostasia, un campo limpio de sangre, un mínimo de trauma tisular y un cierre cuidadosa de la piel.

4. Se discute la importancia de un tratamiento postoperatorio cuidadoso.

5. Se incluye el análisis de 40 casos. Se sacan conclusiones que se discuten. La revisión de casos constituye 35 hombres y 5 mujeres. La edad promedio fué de 46 años. Los resultados funcionales fueron buenos en 34 casos. En 6 casos el padecimiento era bilateral.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die Ursache der Dupuytrenschen Kontraktur ist noch immer unbekannt. Gewisse beiträgliche Faktoren können von Bedeutung sein und werden erörtert.

2. Der chirurgische Eingriff ist offenbar noch immer die beste Form der Behandlung. Er besteht in völliger Resektion aller befallenen Teile der Faszie der Handfläche und aller ihrer Befestigungen an (a) der Haut, (b) den Phalangen, (c) den Metakarpalknochen, (d) den interfaszialen Septen und (e) der volaren interossalen Faszie.

3. Als wichtige Faktoren in der Erzielung guter Resultate werden eine aseptische Technik, ein blutleeres Operationsfeld, sorgfältige Blutstillung, ein Mindestmass von Gewebsschädigung und ein sorgfältiger Verschluss der Haut hervorgehoben.

4. Die Wichtigkeit sorgfältiger postoperativer Nachbehandlung wird erörtert.

5. Es liegt eine Analyse von etwa 40 Krankheitsfällen vor, aus der gewisse Schlussfolgerungen gezogen und erörtert werden. Das durchschnittliche Lebensalter von 35 männlichen und 5 weiblichen Patienten betrug 46 Jahre. Die funktionellen Ergebnisse waren sehr gut in 34 Fällen, gut in 4 und schlecht in 2 Fällen. Bei 6 Kranken handelte es sich um eine doppelseitige Erkrankung.

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It was a common reflection a couple of decades ago that treatment lagged behind diagnosis the physician was often accused of being more interested in the latter than in the former Insofar as the charge had reference to the common bacterial infections the lag has been eliminated Indeed, the position has perhaps been reversed There is in this field such a wealth of available resources in treatment that the tempta tion to "get busy" with one or more of the "sulpha" drugs or with one or other of the "antibiotics" or, indeed, with one or other of both of these, before the nature of the infection is fully ascertained, is almost irresistible This is not always the doctor's fault, his hand is sometimes forced by the patient's anxious friends, who do not know, as does the doctor, that powerful remedies sometimes have "side effects" and that the patient's germ may have been rendered insensitive to the "antibiotic" when he badly needs it, because he has already received it when it was not really necessary or even indicated

—Lord Horder

Malignant Tumors of the Tongue, the Floor of the Mouth and the Pharynx

E. M. SKOLNIK, M.D., F.A.C.S., F.I.C.S., D.A.B.

CHICAGO, ILLINOIS

THE importance of the management of oral and pharyngeal carcinoma has been well documented by statistical and clinicopathologic studies. Malignant neoplasms of the tongue and mouth vary in their appearance, clinical course and prognosis in accordance with the site of their origin. Significantly, however, they are characterized clinically by the presence of early metastases to the cervical lymph nodes and too frequently are first seen as swellings in the neck rather than as a tumor in the mouth. This applies rather strikingly to pharyngeal carcinomas as well, particularly those of the hypopharyngeal region.

Carcinomas of the oral cavity comprise about 4 per cent of all malignant growths and are invariably of the squamous cell variety. The large number of cases encountered makes it imperative that careful examination of the oral cavity be made, particularly by the otolaryngologist and the dentist, who have such intimate contact with this area. A program of cooperation will certainly lead to early diagnosis of the primary lesion and subsequently to a higher percentage of cures associated with better functional and cosmetic results. Biopsies of all suspected lesions must be performed in order to accomplish this end.

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With the advent of new technics in roentgen and interstitial irradiation, the therapy of malignant disease took on a new perspective, differing from the routine surgical approach. A relatively low survival rate, however, has made it imperative to reevaluate the methods of treatment available, so that today one finds the pendulum swinging back to surgical extirpation of carcinoma of the tongue, the floor of the mouth and the hypopharynx. Current knowledge of the many problems of treatment, together with new surgical technics, new forms of anesthesia, the use of antibiotics and a better understanding of nutritional requirements and electrolyte balance, has made the surgical approach more efficacious.

An overall evaluation reveals an increase in the rate of surgical cure. Surgical treatment has the advantage of eliminating the primary lesion quickly and effectively, so that the secondary lesions can be approached sooner; eliminates the constant debilitating pain frequently associated with irradiation, and ameliorates the terminal phases when the disease is uncontrollable. On the other hand, irradiation may be interchangeable with operation in the treatment of certain primary tumors, while in some cases irradiation may be the therapy of choice. The combination of several methods for extensive lesions has proved successful.

The principles of management of can-

cer of the tongue, the floor of the mouth and the pharynx will be dealt with separately, according to the site, the degree of extension and the histologic picture

Carcinoma of the Tongue—In the order of frequency, carcinoma of the tongue involves the lateral border, the superior surface, the tip and, rarely, the inferior surface Cancer of the base of the tongue is frequently undiagnosed for a relatively long period and is often associated with pain referred to the ear Because of the location such a lesion can be best demonstrated either by indirect laryngoscopic study or by palpation The importance of using the finger to palpate the base of the tongue cannot be overemphasized

Metastasis more often involves the deep cervical lymphatic chain, less frequently it occurs in the submaxillary area In about 25 per cent of the cases bilateral metastasis is present To complicate the choice of procedure further, it has been shown that the lymphatics from the tongue and the floor of the mouth are intimately related to the periosteum of the mandible and must be carefully evaluated prior to therapy

The prognosis as well as the therapy of choice depends upon the size of the tumor, the histologic picture and the presence or absence of metastasis The location of the lesion definitely influences the outcome Neoplasms extending to the anterior pillar usually involve the mandible, and involvement of the midline presents the problem of *bilateral metastasis Elective neck dissections* also give evidence of better rates of cure For early diagnosis, a biopsy of any lesion resistant to conservative management, particularly leukoplakia with pronounced thickening and ulceration, is essential Needless to say, any malignant tumor near the midline has a poor prognosis, owing to the possibility of cross metastasis

The treatment of carcinoma of the tongue and its cervical metastases is well documented, although there is still some diversity of opinion as to approach, modalities of therapy and technic

In the anterior third of the tongue the lesions are usually superficial, do not invade the muscle and are slow to metastasize The treatment of choice is wide surgical excision, the extent of which depends upon the size of the tumor and which may frequently be a partial glossectomy

In the middle third, which is the most common area of involvement, the routine hemiglossectomy may suffice Because of the insidiousness of lesions of the tongue and the frequency with which they metastasize, operation is preferred It is by far the most expeditious treatment, it offers better control of the amount of tissue removed, and it does not leave a residuum of tissue damaged by irradiation

In the base of the tongue, lesions without metastases are rare This is indicative of a poor prognosis, and, whenever possible, primary surgical extirpation is to be preferred If this is not feasible, irradiation and/or the use of radon seeds can be utilized with the hope of sterilizing the primary lesion, in which case a radical neck dissection can be performed at a judiciously selected time

If there is spread to the soft tissue adjacent to the tongue and there is an adequate amount of normal tissue of the floor of the mouth between the lesion and the medial surface of the mandible, the primary lesion is resected *en bloc,* with a radical neck dissection (mandible-splitting or pull through operation)

If infiltration results in extensive involvement of the floor of the mouth with encroachment on the mandible, then *en bloc* removal of the primary lesion, the floor of the mouth and the mandible, in combination with radical neck dissection, should be performed In such cases it is advisable to ligate the external carotid artery

Since cervical adenopathy develops in a

large percentage of patients with cancer of the tongue, the results of treatment of the primary lesion depend in great part on treatment of the metastatic nodes.

There can be no compromise as to the proper management of the adenopathy; surgical intervention, in the form of a radical neck dissection, is the accepted treatment. There is no place for local excision of nodes or partial neck dissection.

The criteria for a therapeutic neck dissection, as established by Duffy are as follows:

1. The primary lesion must be sterilized. 2. The primary lesion should be limited to one side of the mouth. 3. The capsule of the cervical node should be intact. 4. Cross metastases should be absent. 5. There should be no distant metastases. 6. Minimal cervical spread offers a better outlook. 7. The lesions should be histologically differentiated. 8. The patient should be in good condition.

Evaluation of these criteria reveals a general picture that will lead to a more favorable prognosis. If bilateral metastases prevail, however, a bilateral radical neck dissection can be performed. An interval of several weeks may be necessary between the two operations because of the problem referable to the internal jugular veins.

If the nodes are movable, the treatment of choice is surgical. Its extent will depend upon the involvement. When there is an adequate amount of normal tissue between the primary and the medial surface of the mandible, a pull-through technic is employed in which the neck dissection and the primary lesion are removed *en bloc* without sacrificing the lower jaw.

When the floor of the mouth is fixed, the *composite operation* is performed (radical neck dissection, hemimandibulectomy, removal of the floor of the mouth and hemiglossectomy *en bloc*).

This surgical procedure may be preceded (four to six weeks) by radiation therapy in order to (1) shrink the lesion to operable size, (2) devitalize the diffused tumor cells and (3) enclose the tumor cells within fibrous tissue.

It should be evident that such an extensive lesion has a poor prognosis and that the therapy appears to be an attempt made in sheer desperation. It has been observed that, even though the procedure may not be curative, the patient is far more comfortable after surgical extirpation than with the roentgen irradiation or a policy of allowing the tumor to follow its own course of destruction, which results in excruciating and uncontrollable pain.

The presence of cross metastases, metastases below the level of the clavicle or a lesion that fixes the tongue completely are contraindications to the composite procedure.

Adenopathy at the angle of the mandible frequently falls into the category of the inoperable, since many such nodes are fixed to the mandible and the surrounding tissues.

The elective neck dissection for carcinoma of the tongue is still a matter of great controversy. Statistics reveal that metastatic nodes will develop in about 40 per cent of patients without adenopathy, becoming evident within six months after treatment of the primary lesion. This in itself is an indication for elective neck dissection; however, authors opposed to this view place great emphasis on local recurrence, which often renders an elective procedure useless, owing to the uncontrollable recurrence of the primary lesion. Although this controversy exists, one must be reminded of the advances of therapy and the ever-increasing percentage of sterilization of the primary lesion.

On the basis of the probability that adenopathy will develop in a large percentage of patients, that many nonpalpable nodes do contain cancer and that the prognosis

becomes less favorable once the nodes have become palpable, an elective neck dissection seems in order

According to Ackerman and Regato, "external irradiation of malignancy of the tongue alone rarely succeeds in sterilizing the primary However, as a preliminary step to interstitial radiation it may be used to great advantage in reducing the size of the tumor and making interstitial therapy less hazardous as to necrosis of surrounding tissue"

Peroral roentgen therapy is best utilized for lesions of the anterior third of the tongue, which are easily accessible to therapy.

Interstitial therapy has proved most effective for carcinoma of the tongue With its use the irradiation is concentrated on the tumor area, with relatively little effect on normal tissue

Carcinoma of the Floor of the Mouth — Cancer of the floor of the mouth, so frequently overlooked in its early stages, may appear as a superficial ulcer or papillary growth that is prone to extend submucously, with invasion of the musculature and the submaxillary gland Not infrequently the lesion becomes adherent to the inner aspect of the mandible, less commonly it encroaches on the tongue Metastases occur readily to the submaxillary and deep cervical lymph nodes on the same side and often on the opposite side

The surgical procedure of choice depends upon the size and location of the lesion and the presence or absence of cervical nodes

If the lesion is less than 2 cm in diameter and no metastases are present, the tumor can be circumvented electrosurgically Elective neck dissection is justified in some instances, the relatively high frequency of cross metastases, however, must be considered and will favor a more conservative approach

If the lesion is small and associated with metastases, unilateral or bilateral, a radical neck dissection (unilateral or bilateral) is performed *en bloc* with the primary lesion (pull-through technic)

As with carcinoma of the tongue, if the lesion involves the periosteum of the mandible or invades the bony structure, the composite procedure is utilized

The lymphatic channels from the tongue and floor of the mouth have been shown to run proximal to the periosteum of the mandible, and thus may account for the many procedures in which hemimandibulectomy is included in the resection

Should the lesion be extensive and approach the midline, a radical neck dissection on the same side in conjunction with a suprahyoid dissection on the opposite side is to be considered, since the submaxillary area is the most common site of extension of the primary lesion

Again, as with carcinoma of the tongue interstitial radiation has been the most promising because of the accurate distribution and the administration of sufficient doses to the entire tumor with minimal damage to the contiguous healthy structures The most common complication is necrosis of the soft tissue of the mouth and mandible, which can be corrected with little difficulty

The causes of failure in the treatment of intraoral carcinoma are (1) the delay of the patient in seeking medical advice (increase in size, extension to adjacent structures, metatasis), (2) refusal of the patient to complete recommended therapy, (3) delay by the referring physician in initiating adequate therapy, (4) inability to control the primary lesion (inadequate operation or irradiation), with repeated recurrence and metastasis, (5) the presence of lymph nodes and bone involvement in relation to the difficulty of treatment, and (6) inadequacy of the follow-up in order to observe the patient for residual disease

Carcinoma of the Pharynx.—Anatomically, the pharynx may be divided into nasopharynx, oropharynx and hypopharynx. This paper is mainly concerned with malignant disease of the oropharynx and the hypopharynx.

Malignant tumors of the tonsils represent approximately 20 per cent of pharyngeal carcinomas and slightly less than 2 per cent of all carcinomas.

At present the overall problem of management of carcinoma of the tonsils is primarily concerned with radiotherapy (external irradiation, interstitial radiation or a combination of the two).

The effectiveness of irradiation of the primary lesion depends upon the histopathologic picture; a well-differentiated carcinoma is relatively radioresistant in comparison to an anaplastic carcinoma or a lymphepithelioma particularly lymphosarcoma. Radon seed implantation is useful in increasing the tumor dose to the primary lesion without extensive irradiation of normal tissue.

Though irradiation is the method of choice, there are instances in which operation is effective. A small isolated lesion of the tonsil without involvement of the contiguous structures and without palpable nodes in the neck can be treated adequately by tonsillectomy; such instances are rare, however, and one should maintain constant vigilance for cervical nodes.

In the presence of cervical metastasis, sterilization of the primary lesion by irradiation is followed by neck dissection. In occasional cases a wide resection including radical dissection of the neck, the mandible, the floor of the mouth and the lateral pharyngeal wall may be required. If the base of the tongue is involved by direct extension, a hemiglossectomy is included in the extensive resection.

The presence of high, unresectable nodes is a contraindication to surgical therapy. Irradiation in these circumstances is a palliative measure, but frequently the treatment must be discontinued before the reaction becomes too severe.

No controversy exists as to the treatment of cancer of the hypopharynx. The accomplishments of roentgen therapy are extremely poor, and the severe reaction of the patient subjected to such extensive irradiation has designated surgical treatment as the method most likely to succeed.

Patients undergoing adequate irradiation are faced with a severe debilitating situation as a result of dryness of the mucous membranes, pain, dysphagia, tracheotomy and gastrostomy that invariably ensue.

Operation in the past was usually accompanied by a very high mortality and morbidity rate, but with the many advances made in the care of the patient as well as in the operative technic, the future is far more promising, Today it is reassuring to note that most lesions of the hypopharynx are operable.

The decision to operate is not based on the extent of the primary lesion, but rather on the metastatic spread. It is the latter that determines the choice of operation.

Characteristic of this region is the rich lymphatic drainage, with a high incidence of cervical metastases. It is this fact that makes it necessary to invariably perform an incontinuity laryngopharyngectomy (if necessary, laryngopharyngoesophagectomy) and radical neck dissection on the involved side of the lesion either in the presence or absence of nodes. Removal should extend from the base of the tongue to the third tracheal ring, including the hyoid bone and thyroid on the side involved.

If a midline lesion exists, however, adenopathy may become evident on either or both sides and therefore radical neck dissection is deferred until nodes are palpable.

Contraindications to surgical treatment

are (1) poor general condition of the patient, (2) metastases to distant areas, (3) extension of the tumor into the posterior musculature and vertebral column (4) if fixation of the lesion with lateral extension into the neck and the presence of immovable nodes

A very important phase of the treatment is rehabilitation of the patient This pertains to loss of the voice, tracheotomy, and often feeding through the esophagostomy in those cases in which the entire hypopharyngeal area is extirpated and may require several reconstructive procedures to reestablish continuity between the mouth and the esophagus

SUMMARY

The author discusses the treatment of malignant tumors of the tongue, the floor of the mouth and the pharynx, with the indications and contraindications for surgical intervention in each instance The value of roentgen irradiation and interstitial irradiation in certain cases is pointed out Cooperation between the otolaryngologist and the dentist is strongly advocated as a program leading to early diagnosis and an increased percentage of cures

SUMARIO

O tratamento ideal para pseudocistos e a extirpação total, mas por causa de razões quase nunca e possivel levar se a efeito tal intervenção O tratamento pratico reconhecido de cisto pseudopancreatico no passado era a marsupializaçao que de maneira alguma e satisfatorio Em 1931 Jurasz estabeleceu a anastomose entre o cisto e a parede gastrica Desde então inumeros autores tem publicado relatorios de casos individuais O autor começou a anastomose interna em 1952 e desde então tratou de 9 pacientes O relatorio desses 9 casos e apresentado O autor não proclama a originalidade de tratamento empregado

RESUMEN

El autor trata del tratamiento de los tumores malignos de la lengua, del piso de la boca y de la faringe, con las indicaciones y contraindicaciones para la intervencion quirurgica en cada caso Se señala el valor de la irradiacion rontgen y de la irradiacion intersticial Es muy recomendable la colaboracion entre el otorinolaringologo y el dentista con el objeto de hacer un diagnostico precoz y aumentar el porcentaje de curaciones

RÉSUMÉ

L'auteur discute le traitement des tumeurs malignes de la langue, du plancher buccal et du pharynx, avec leurs indications et contreindications operatoires

Il insiste sur la valeur de l'irradiation roentgenologique et de l'irradiation interstitielle dans certains cas Une collaboration entre l'otolaryngologiste et le dentiste est vivement recommandee, elle permet un diagnostic precoce ainsi qu'un plus grand pourcentage de guerisons

RIASSUNTO

L'autore discute la cura dei tumori maligni della lingua del pavimento della bocca e del faringe, con le indicazioni e controindicazioni all'intervento chirurgico in ogni caso

La roentgenterapia e la terapia irradiante interstiziale hanno valore in certi casi, la cooperazione fra otoiatra e dentista e assolutamente necessarie se si vogliono ottenere dei risultati soddisfacenti

ZUSAMMENFASSUNG

Der Verfasser erortert die Behandlung bosartiger Geschwulste der Zunge, des Mundbodens und des Rachens unter Ar

gabe der Indikationen und Gegenindikationen für chirurgisches Eingreifen in den einzelnen Fällen. Auf den Wert der Röntgenbehandlung und interstitieller Bestrahlung in gewissen Fällen wird hingewiesen. Es wird die Forderung einer engen Zusammenarbeit swischen Hals-Nason-Ohrenärzten und Zahnärzten erhoben mit dem Ziel frühzeitiger Diagnosestellung und Erhöhung der Heilungsquote.

With regard to socialized medicine in Britain the baits dangled before the G.P. were most attractive. No longer was he to work in isolation. "Health Centres" were to be provided and group practice was to be encouraged. Facilities for post-graduate instruction were to be increased. What has actually happened? The very opposite of all this. The G.P. finds himself to a large degree side-tracked. He is today a "filter" (the word has actually been used in official reports), a sieve with a very large mesh. He spends much of his time signing forms by which he unloads his patients upon institutions and specialists who know little of the early history of their diseases and nothing at all of their domestic conditions. No health centres have, as yet, after four years, been set up. Or is it one? There is much less post-graduate instruction than there was five years ago. More serious still, the "close-up" between doctor and patient, which we had learned to be the *sine-qua-non* of medical care, has been grossly interrupted. Less and less do they see of each other, whether in the home, in the doctor's office, or in the hospital.

—Lord Horder

Plastic and Reconstructive Surgery

Treatment of Extensive Defect of Scalp and Skull

Report of A Case

CHARLES P VALLIS, M D ,* AND STOFER P HUMPHREYS, M D **

SALEM, MASSACHUSETTS

THE scalp, with its dense network of freely anastomosing blood vessels, is an area for which the construction and transposition of pedicle flaps of varied sizes can be accomplished without delay.[1]

In a case of ordinary traumatic partial avulsion of the scalp without exposure of the bone, the denuded area can easily be covered immediately, either with split thickness grafts or with adjacent flaps, if there is no infection present.[2] In most cases in which the bare bone is exposed, immediate coverage with an adjacent flap can usually be done before infection sets in. When the periosteum is destroyed and the exposed bone does not appear viable, drill holes through the outer table into the diploe will often stimulate the growth of granulation tissue, which can then be covered with a skin graft.[3] Again, this will be successful only if there is no gross infection of the bone

In the following case there was extensive loss of scalp with long-standing osteomyelitis of the skull

REPORT OF A CASE

A 61-year-old white woman was admitted to the Salem Hospital on Feb 27, 1954, with extensive necrosis of the scalp and skin of the left arm, shoulder and left lower abdominal region The patient was in a confused state of mind and was completely unreliable A satisfactory history was not obtainable There was a questionable history of trauma and/or burns to these areas approximately one month prior to admission The police who brought her to the hospital stated that they had found her lying on the floor of her room in a state of filth and desiccation.

Fig 1 —Large traumatic defect of scalp and skull (see text).

*Instructor in Surgery (Plastic), Tufts Medical School Consultant in Plastic Surgery, Salem Hospital
**Consultant in Neurosurgery Salem Hospital.
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On initial examination the intern noted an extremely foul odor about the patient, signifying the probable presence of necrotic infected tissue. Examination on admission showed extensive gangrene of practically the entire left half of the scalp and similar areas on the left arm and shoulder and the lower part of the abdomen. The areas of necrosis were débrided shortly after her admission. She was given supportive therapy. Her course was highly septic from the day of admission. A culture taken on that day showed Bacillus proteus sensitive to chloromycetin.

One of us (C.P.V.) first saw this patient on March 1. At that time there was a large defect of the entire thickness of the scalp and periosteum over one-third of the scalp area, with complete exposure of the outer table of the skull (Fig. 1*A*). The outer table showed dark discoloration and appeared nonviable. Roentgenograms of the skull taken on March 5, showed loss of soft tissue in the left parietal region, without evidence of accompanying cranial or intracranial pathologic change.

In a discussion of this problem with the neurosurgical consultant, it was decided that the necrotic outer table would have to be removed before any coverage of the defect could be accomplished. Our opinion was that, after removal of the necrotic bone, healthy granulations would form, and these could be subsequently covered with a skin graft.

After two weeks in the ward under a regime of transfusion, antibiotic and mechanical débridement, the patient was taken to the operating room on March 10. General anesthesia was induced and a small hole was made through the outer table with a trephine. Foul-smelling pus was released. The entire exposed outer table was removed with a Smith-Petersen osteotome by removing buttons of outer table made with the trephine (Fig. 1*A*). A large quantity of foul-smelling pus containing a pure culture of B. proteus was present between the outer and inner tables of the skull. It was noted that the infection had also extended through the inner table, and an area of the inner table measuring approximately 2 inches (5 cm.) in diameter was removed with ronguers (Fig. 1*B*). The dura was thus exposed. The infection did not extend through the dura.

At this point it was decided to treat the area conservatively, in order to control the extensive infection and allow healthy granulations to cover the exposed dura and bone. Daily sterile saline dressings were used, and by March 31, the entire wound was covered with

Fig. 2.—Defect under treatment (see text).

clean granulations, with no evidence of gross infection. Since there was an area 2 or 3 inches (5 to 7.5 cm.) in diameter where both the inner and the outer table of skull had been removed, it was decided to cover this wound with an adjacent scalp flap.

On March 31, with the patient under general anesthesia, a large scalp flap involving the entire right half of the scalp was outlined (Fig. 2*A*). The flap was based in the occipital area and extended the entire length of the scalp from the frontal area to the extreme occipital. It was 4 inches (10 cm.) wide and at least 8 to 10 inches (20.3 to 25.4 cm.) long. The flap was raised off its bed except for the occipital attachment, and, despite its huge size, it maintained its viability (Fig. 2*B*). It was swung medially to cover the large granulating defect in the scalp. The original bed of the flap was covered with a split-thickness skin graft (Fig. 3*A*).

After the operation the flap remained completely viable and healed without complications. On April 21, the redundant and twisted base of the flap was transected and the distal half of the flap returned to its original anatomic position (Fig. 3*B*). Complete healing resulted

without residual drainage, and the patient was discharged on May 6.

Because of the patient's erratic social habits, she was sent to a women's state reformatory She was not seen again until November 10, when one of us (C.P.V.) visited her at the reformatory. According to the statement of her physician there, she had shown no evidence of recurrent infection of the scalp. There was complete epithelialization. The area where the inner table had been removed was quite firm and well protected by the scalp flap. There was normal growth of hair over the entire scalp except for the right frontoparietal area, which had been grafted with a split thickness skin graft (Fig. 4).

COMMENT

This case demonstrates several important basic considerations in the treatment of injuries of this type:

1. Radical treatment of an extensive osteomyelitis of the skull necessitating removal of all infected necrotic bone. In such a case the involved portion of the inner table should also be removed, even though the dura will necessarily be exposed.

2. Utilization of granulations to fill out large defects of the skull and form a firm protective vascular bed over exposed dura and bone

3 The rich circulation of the scalp, which enables the surgeon to transfer large flaps without delay. In the case here reported the entire right half of the scalp was elevated and transferred without delay, and complete viability of the flap was maintained.

SUMMARY

A case in which there was an extensive long-standing loss of scalp, with osteomyelitis of the exposed skull, is presented. The treatment employed in this case emphasizes the value of the radical surgical approach to extensive osteomyelitis of the skull and also demonstrates the excellent

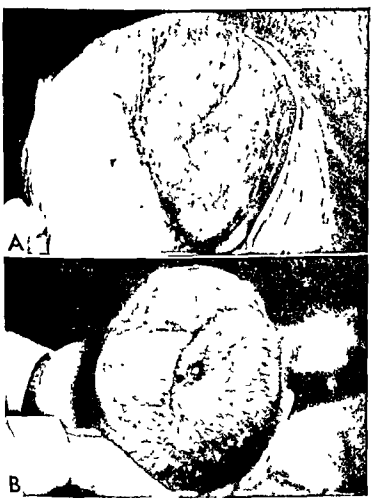

Fig. 3.—Defect after suturing (see text).

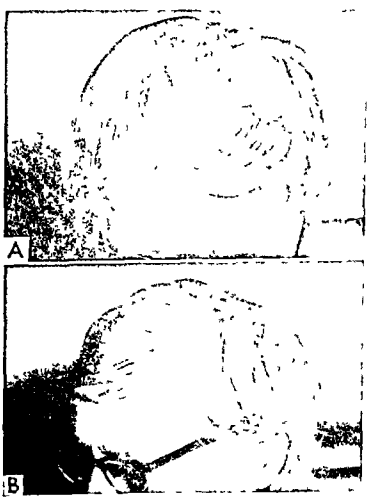

Fig. 4.—Result (see text).

blood supply of the scalp, which permits large pedicle flaps to be prepared and transferred without delay.

RÉSUMÉ

L'auteur présente un cas ancien de perte étendue du cuir chevelu avec ostéomyélite du crâne. Il insiste sur la valeur d'une chirurgie radicale en pareil cas, l'excellente vascularisation du cuir chevelu permettant la préparation et l'application rapide de grands lambeaux pédiculés.

RESUMEN

Se presenta un caso con una gran pérdida de cuero cabelludo y osteomielitis del cráneo que se encontraba descubierto.

El tratamiento empleado ilustra el valor del tratamiento quirúrgico de la osteomielitis avanzada del cráneo, demostrando igualmente la gran vascularización del cuero cabelludo que permite la preparación rápida de grandes injertos pediculados.

SUMARIO

A autor apresenta um caso, no qual havia perda antiga do couro cabeludo com osteomielite do crânio exposto.

O tratamento usado nêsse caso salienta o valor da intervenção cirúrgica radical para osteomielite extensa do crânio e demonstra também o excelente suprimento sanguíneo do couro cabeludo, o que permite serem grandes retalhos de pedículo preparados e transferidos.

CONCLUSIONI

Viene presentato un caso di scuoiamento del capillizio con perdita di sostanza datante da lungo tempo ed osteomielite della teca cranica scoperta.

La cura attuata dimostra le possibilità del trattamento chirurgico radicale dell'osteomielite del cranio e le eccellenti possibilità di irrorazione del cuoio capillizio il quale permette l'impianto di ampi lembi peduncolati.

ZUSAMMENFASSUNG

Es wird über einen Fall von umfangreichem lange bestehendem Verlust der Kopfhaut mit Osteomyelitis der entblössten Teile des Schädels berichtet.

Das angewandte Behandlungsverfahren bringt den Wert radikalen chirurgischen Vorgehens bei ausgedehnter Osteomyelitis des Schädels zum Ausdruck und gibt gleichzeitig ein Bild von der ausgezeichneten Blutversorgung der Schädeldecke, die Herstellung und die unverzügliche Uebertragung grosser gestielter Lappen gestattet.

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Editorial

Forthcoming International Congresses of the International College of Surgeons

The speed with which life's current hurries us along is, of course, proverbial; but we are sometimes inclined to forget the corollary, that no current is swift enough to deprive us of vision, and while we have vision we are capable of both achievement and delight. Looking backward over the years is as good a proof of this as any man can desire. Recollection reassures us that even in midcurrent we have had time to dream, to laugh, to weep, to fight and win, to fight and lose and to rise again from defeat. We have known love and friendship, aspiration and despair; we have toiled and enjoyed the fructation of our labor; we have found time, again and again and again, to clasp the hands of those on our own far-faring voyage—sometimes, it is true, like "ships that pass in the night," but far oftener like ships that meet and hail one another joyfully, times without number.

We are now looking forward to another soul-satisfying event, the September Congress in Chicago, and still another, an international scientific Congress to be held in Mexico City. Since our Constitution permits us to hold such meetings whenever the Board of Governors shall assent, the Mexican invitation was accepted with joy —which was but natural, as so many Fellows of the College have delightful memories of the Congress held there fifteen years ago, which was organized by Prof. Dr. Manuel A. Manzanilla and supported by Dr. Victor Fernandez Manero, former Minister of Health of the Mexican Government.

It was originally planned that the international meeting immediately forthcoming should be held in Buenos Aires, where our friends of the Argentine Section have entertained us so royally in the past. Political changes in Argentina, however, made it necessary to abandon this visit, and the Board of Governors, after due deliberation, decided on Chicago for the meeting.

The September Congress will bring to Chicago a veritable galaxy of outstanding surgical talent. Among the distinguished visitors from abroad will be Profs. Drs. Rudolph Nissen of Basel, Switzerland, President of the College; Felix Mandl of the Kaiser Franz Josef Hospital of Vienna; Tassilo Antoine, dean of the Medical Faculty, Vienna; Raymond Darget of the University of Bordeaux; Lucien Leger, of the University of Paris; Carlos Gama, of the University of São Paulo, Brazil; Clovis Salgado, Minister of Health of São Paulo; Henricus J. M. Weve, of the University of Utrecht, Netherlands; Pedro A. Gutienez Alfaro, Minister of Health of

Caracas, Venezuela; Alfred Borjas, of the Faculty of Medicine of Caracas; Jorge Taiana and Abel N. Canonico of the University of Buenos Aires, Argentina; Leon Gerin-Lajoie, of the University of Montreal; Lyon H. Appleby, of Vancouver; Albert Jentzer, of the University of Geneva, Switzerland; Eurico Branco Ribeiro, President of the Brazilian Section; Lucas Monteiro Machado, of the University of Belo Horizonte, Brazil; Prof. Manuel A. Manzanilla of Mexico City, who is organizing our anticipated scientific assembly there and has done such creditable work in connection with our previous international meeting held in Mexico; Cesar A. Pantoja, of the University of Bogota; Hachiro Akaiwa, of Kyushu University, and Tanzo Takayama, of Sapporo Medical College, Japan; Edmond Velter, of Faculty of Medicine, Paris; George Chapchal, of Utrecht; Alberto Sabogal, of Callao, Peru; Leopold Lambert, of Liege, Belgium; André Nicolet of Berne, Switzerland; Marcel Thalheimer, of Paris; and Lt. Col. Pandalai, Editorial Chairman of the Indian Journal of Surgery and President of the Indian Section, and many others.

Space forbids including a complete list of these eminent participants, or of their equally distinguished colleagues in the United States. Among the latter, mention may be made of Drs. Gershom J. Thompson, Virgil Counsellor, John S. Lundy, J. Arnold Bargen and Arnold Jackman of the Mayo Clinic, Rochester, Minnesota, and others too numerous to mention.

The program, which is in the able hands of Dr. Peter Rosi, may be confidently expected to surpass all its predecessors, though the level of excellence has always been high. In addition to the General Assembly and the impressive array of exhibits, the various specialized groups within the College will present their own programs, symposiums and panel discussions, as has become customary; the Film Forum and the Surgical Nurses' Section will be featured as usual. The Woman's Auxiliary, which has distinguished itself by its achievements in the establishment of scholarships and fund-raising in the interest of the College, has planned a program for every day of the Congress.

It will be an immense pleasure to share with our guests the phenomenal progress of the College and of the International Surgeons' Hall of Fame, to which valuable shipments are constantly arriving from many parts of the world. We look forward also to the equally great satisfaction of discussing with them our plans for developing to the utmost our new School of the History of Surgery and Related Sciences and receiving their own suggestions and contributions to the plan. Many will come to us from nations where some of the most dramatic and epochal events in surgical history took place and where the cultivation of knowledge of that history has been a part of the national culture for many centuries. We in America are by no means lacking in realization of the immense value of such a heritage, to the building of which, in our own blessed country, we confidently hope that both the Hall of Fame and the School of the History of Surgery and Related Sciences will have much to offer. Nothing could be better for the advancement of such enterprises than an appreciative blending of the Old World and the New; nothing could be more fundamentally in keeping with the College tradition. We shall therefore heartily welcome our friends to Chicago, first for the pleasure it will give us to return in kind the warm and unforgettable hospitality they have so often accorded us, and again for the delight of having them as eye-witnesses and actual participants in what we have undertaken to accomplish.

Indeed, it is hard to find words strong enough to express the satisfaction felt by

every member of the College in these two new contributions to science, history and the humanities Their development has been extraordinarily rapid, but quick and effective action, once a plan has been conceived, is characteristic of the College, no effort is too oppressive, no sacrifice too great, if it brings together the surgeons of the world, and with them a multitude of kindred spirits, in the bonds of universal friendship It has always been obvious that our Congress programs, with their wealth of scientific interchange, have been equally remarkable for the spirit of good will that pervades them

To the International College of Surgeons the spirit of good will seems the most natural thing in the world and the pulling and hauling of organizational and interorganizational political maneuvers *the most unnatural and the most soul destroying* 'Let him that thinketh he standeth take heed lest he fall"—perhaps it is because this precept, though seldom mentioned among us, is at the very root of all of our College endeavors, that we can look forward to each successive Congress with unmixed joy Not one of them has failed us in the past, not one but has enriched the treasure house of memory, brought old friends together and joined new friends in the indissoluble bonds of a shared ideal

In a word, the auspices have never been more favorable The College has reason to anticipate a meeting that will make surgical history

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The decentralization of surgery is in progress, and should be welcomed Harley Street has lost its magic, and even those who practise in its dreary barracks must welcome the change, for the artificial stamp of excellence which it confers has attracted to its neighbourhood every consultoid and confidence trickster who can afford the rent of a room We should ensure, however, that in every town and village where surgery is practised there is a man well versed in its art and craft if not necessarily in its science We should give him opportunity to acquire and maintain his skill, and a recognition of his position We should make the open door still more open, ensuring that those whose ability is patent can undertake more and more responsible work even if this implies that those whose early promise has not been fulfilled should undertake tasks of lesser importance And we should work for some kind of recognition not of degrees or position but of intrinsic worth, so that the public may know to whom it can turn for authoritative information, and the processes of law may be guided by wise counsel

—*Ogilvie*

Important Announcement

We regret to state that recently, to our great amazement, an unwarrantable liberty was taken by the Isodine Pharmacal Corporation, namely, the unauthorized use of the Journal's name and letterhead in their commercial promotion of their product. The action apparently had no other basis than our having published, in all good faith, a research article mentioning the product concerned.

Needless to say, the publication of such an article in no way implies endorsement or recommendation, on the part of the *Journal*, of any commercial product, nor can such an interpretation of it be ignored. The Isodine Pharmacal Corporation has made a formal retraction and apology, a facsimile of which appears below.

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:EDITORIAL DEPT THE JOURNAL OF THE INTERNATIONAL COLLEGE
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:WE HAVE LEARNED WITH DISMAY OF THE EMBARRASSMENT CAUSED YOUR ORGANIZATION THROUGH AN UNFORTUNATE INADVERTENCE OR MISUNDERSTANDING STOP WE REGRET THIS OCCURENCE PROFOUNDLY AND EXTEND OUR APOLOGIES FOR ANY WRONG IMPRESSION WHICH MAY HAVE BEEN IMPARTED TO ANYONE STOP WE NOW UNDERSTAND THAT THIS MAILING WAS WITHOUT YOUR AUTHOIZATION STOP THE FACT IS THAT NO OFFICER OF THE COLLEGE OR ANYONE CONNECTED WITH THE EDITORIAL DEPARTMENT OF THE JOURNAL WAS CONSULTED ABOUT THE MAILING OR HAD KNOWLEDGE OF IT OR GAVE ANY PERMISSION FOR IT STOP WE PROCEEDED ON THE BASIS OF A REGRETTABLE MISUNDERSTANDING AND WE SINCERELY HOPE THAT NO ONE WILL INTERPRET THIS RELEASE AS AN ENDORSEMENT OF OUR PRODUCT BY THE COLLEGE=

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New Books

Books Received—The following books have been received by the Editor, they will be reviewed critically as space and facilities permit Omission of more extended review, however, is not to be taken as criticism of the merit of the book

Cirurgia By Alfredo Monteiro, with the collaboration of Eugenio de Souza Carlos Gomes dos Santos, Ruy Archer, Diomedes Ferreira, Olimpio de Freitas Costa Neto, Newton Salim, Ricardo Castra Paiva, Humberto Barreto, N de Almeida Aguiar, Otavio B Tourinho and Alcides Modesto Leal Rio de Janeiro Rivista Brasileira de Cirurgia 1955 Pp 188, with 84 illustrations

Sachs Essays By Ernest Sachs Hamden, Connecticut The Shoe String Press, 1955 Pp 118 with frontispiece (portrait of author) *Reviewed in this issue*

Handbook of Physical Therapy By Robert Shestack New York Springer Publishing Company, Inc, 1956 Pp 212

Pulmonary Uptake of Oxygen, Acid-Base Metabolism and Circulation During Profound Apnea By Martin H-son Holmdahl Stockholm, Sweden Acta Chirurgica Scandinavica Supplementum 212, 1956 Pp 128, with 36 illustrations

Ankylosing Spondylitis Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment By J Forestier, F Jacqueline and J Rotes Querol Translated by A U Desjardins Springfield, Ill Charles C Thomas, Publisher, 1956 Pp 374, with 145 illustrations *Reviewed in this issue*

Tumors of the Skin By Herbert Conway Springfield, Ill Charles C Thomas, Publisher, 1956 Pp 267, with 178 illustrations 3 in color *Reviewed in this issue*

Studies in Anemia of Injury. By Lars-Eric Gelin Stockholm, Sweden Acta Chirurgica Scandinavica Supplementum 210, 1956 Pp 130 with 58 illustrations

Supplement 1, Atlas of Exfoliative Cytology By George N Papanicolaou Cambridge, Mass Harvard University Press, 1956 Loose-leaf format, published for The Commonwealth Fund

The Office Assistant in Medical or Dental Practice By Portia M Frederick and Carol Towner Philadelphia The W B Saunders Company, 1956 Pp 351, with 55 illustrations

Chirurgie Pelvienne apres Cloisonnement Abdomino-Pelvien (Pelvic Surgery After Separating Abdomen from Pelvis) By Henri Bompart and R Michel Bechet Paris Masson et Cie 1956 Pp 80, with 15 illustrations *Reviewed in this issue*

La Foie et la Veine Porte (The Liver and Portal Vein) By Guy Albot and Felix Poilleux, with 19 collaborators, Paris Masson et Cie, 1954 Pp 381 *Reviewed in this issue*

L'Anesthesie en Chirurgie Thoracique (Anesthesia in Thoracic Surgery) By Oliver Momon, Monod, Michel Herbeau, G Delahaye, G Chesneau, A Juvenelle, F Gautier and M Lafaye Paris Masson et Cie, 1955 Pp 126 *Reviewed in this issue*

Homotoxins and Homotoxicoses· Outline of a Synthesis in Medicine By Hans-Heinrich Reckeweg, with an introduction by Karl Kotschau Baden-Baden Aurelia Publishing House, 1955 *Reviewed in this issue*

Surgery of the Great Veins By R Wanke with the collaboration of H Junge and H Eufinger and a contribution by H Kalk Stuttgart Georg Thieme Verlag, 1956 Pp 126 with 71 illustrations *Reviewed in this issue*

Surgery of the Great Veins. By R. Wanke, with the collaboration of H. Junge and H. Eufinger and a contribution by H. Kalk. Struttgart: Georg Thieme Verlag, 1956. Pp. 126, with 71 illustrations.

This monograph summarizes the surgical treatment of the great veins of the body cavity. After years of their own clinical and experimental work in this field of surgery, the authors describe their own and other surgeons' clinical and experimental experience. The book contains four chapters: *Surgery of the Portal Vein, The Caudal Vena Cava, The Pelvic Veins,* and *The Superior Vena Cava and Axillary Veins.* The therapeutic prcblems and the operative indications, as well as the different technics, are clearly explained with the aid of excellently reproduced roentgenograms, clinical photographs and other kinds of illustrations. The book contains a large bibliography and a good index by title and author. There are many questions that cannot yet be definitely answered, but the book is an excellent guide for the surgeon who is interested in this special aspect of surgery.

HANS BONIN, M.D.

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy, Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 374, with 145 illustrations.

Physicians and surgeons of France were among the first to become intensely interested in arthritis of the spine. More than half a century ago they tried to differentiate the various types of arthritis that would produce ankylosis of the spine and accurately described the several entities. Each of the three authors who have collaborated in this work has previously written clearly and definitively about one or more of the forms of this crippling and deforming disease.

This book was written for internists and surgeons who give much of their time to the diagnosis and treatment of various forms of arthritis and rheumatic diseases. It is also intended for the roentgenologist, who must attempt to differentiate between the several different types of arthritis that will produce ankylosis of the spine, and, as the authors state, it is especially intended for the general practitioner, who is often the first to be consulted by patients with this type of disease.

The problem of ankylosing spondylitis is discussed clearly from the standpoint of its historical background; a classification of the various types of arthritis that will produce spinal changes and symptoms is included, as are the etiologic background of the disease and its diagnosis and treatment.

Dr. A. U. Desjardins of Walpole, Maine, has presented in this book a most excellent translation. The English is clear and graphic, and in the text itself the translator has accomplished to a noteworthy degree the ideal to which he applied himself, as he mentions in his preface: "to render the thoughts, ideas and explanations of the authors as clearly and as fluently as the English language made this possible."

Most of the roentgenograms are well selected and clearly reproduced. This is indeed a reference book containing most of the recorded knowledge about what is still a puzzling and distressing affliction brought upon thousands of unfortunate patients. All who would be of assistance to such patients should become familiar with this volume and have it available close at hand for reference purposes.

EDWARD L. COMPERE, M.D.

La Foie et la Veine Porte (The Liver and Portal Vein). By Guy Albot and Fèlix Poillieux, with 19 collaborators. Paris: Masson et Cie, 1954. Pp. 381.

This is a report on the current management of diseases of the liver and gastrointestinal tract at the Hotel Dieu, Paris, based on staff conferences conducted by the late Prof. Maurice Chiray. The many theoretic and practical problems encountered in the management of diseases of the liver, portal vein and gastrointestinal tract are described in this third volume.

Recent pathologic theories, current scientific research, technics of examination and surgical intervention of the liver are discussed. These are based on objective data resulting from clinical, biologic and histologic investigation. The observations recorded explain practical technical details and are of inestimable value. A clear interpretation is given estimates of liver function obtained by puncture biopsy and by operation. One can acquire a precise idea of the difficult problems connected with

hemolytic jaundice, extrahepatic retention of bile, cholostatic cirrhosis, intrahepatic cholostosis, icteric hepatitis and the various types of cirrhosis

There is an excellent chapter on the pathologic aspects of jaundice and epidemic hepatitis following transfusion

A detailed explanation is given of exploration of the portal vein and tributary organs, liver, spleen and pancreas by splenoportographic investigation Legeir's technic enables him to demonstrate intrinsic obstructive diseases of the portal vein itself, cirrhosis, tumors of the liver, spleen and pancreas and hemorrhage of the digestive tract The surgical correction of portal hypertension and varices of the esophagus by means of splenectomy, portocaval and splenorenal anastomosis, etc, is presented in detail

The book is well illustrated It contains many microphotomicrographs, both in color and in black and white, splenoportograms and schematic drawings, including sketches of the technic of liver resection This work is unique, and the publication of proceedings at these conferences brings valuable information to those interested in the treatment of diseases of the liver, portal vein and tributary organs Anyone who takes the time to refer to this excellent volume will be well rewarded

CHARLES PIERRE MATHÉ, M D

Prerequisites of Good Teaching and Other Essays By Ernest Sachs Hamden, Connecticut The Shoestring Press, 1954 Pp 118, with frontispiece (portrait of author)

Dr Sachs, a Research Associate in Surgery and Medical History at Yale, taught medical students for thirty-five years at Washington University During this time he maintained a "Thursday Clinic" to which his students were invited Their response is sufficiently indicated by the fact that this little book of philosophic essays is dedicated to them

The humanitarian aspect of medicine, sometimes unfortunately neglected, is apparent on every page of this book Modern educators, some of whom argue that one teaches the student, not the subject, would get small quarter from Dr Sachs, who states roundly and rightly that a thorough knowledge of the subject one teaches is a *sine qua non*, yet there is more sympathy and human understanding in his approach than in that of many of the aforesaid educators

The essays proceed from medical education to the conduct of a clinic, the maintenance of ethical standards, the importance of the doctor patient relation and the building up of diagnostic and therapeutic skill The human aspect reappears movingly in Dr Sachs' essays on patients with so-called hopeless disease and on "comforting a family in a desperate case or when an operation has been unsuccessful" *Young physicians and surgeons could do* worse than to acquire, read and absorb this small but potent analysis of the career he has chosen Their elders will find in it pleasure and relaxation, together with a nostalgic reconnaisance of certain memories most doctors have in common

M T.

Chirurgie Pelvienne après Cloisonnement Abdomino-Pelvien (Pelvic Surgery After Separating the Abdomen from the Pelvis). By Henri Bompart and R Michel Bechet Paris Masson et Cie, 1956 Pp 80, with 15 illustrations

This volume is devoted to an ingenious technic for isolation of the pelvis from the abdominal cavity by creating a protective peritoneal barrier, facilitating extensive surgical procedures with an increased margin of safety

In the surgical treatment of cancer today the objective is to remove the largest possible amount of lymphoid tissue that may be invaded The authors apply it for the block removal of cancer of the body and cervix of the uterus, the lower part of the bowel or the bladder, including the overlying parietal peritoneum, the adjacent cellular tissue and the lymph nodes They also utilize it for removal of the uterus in cases of uteroadnexal suppuration

This technic differs from that of Franz Olthner (1917), who stripped the parietal peritoneum from the cellular glandular tissue, necessitating the removal of lymph nodes piecemeal The authors' improved method permits block excision of the uterus, rectum or bladder together with the peritoneum, cellular tissue and lymph nodes

Important points in this new technic include a midline abdominal incision and, at the beginning of the operation, a transverse incision of the anterior *parietal peritoneum This* forms a flap, which is sutured without tension to the posterior peritoneum and the rectum just above the iliac vessels The lateral gutters are closed by placing the index finger subperitoneally and suturing the peritoneum in the same manner as one closes a hernial sac. After

isolating the abdomen from the pelvis, the authors employ the technic of Alexander Brunschwig for removal of the cancerous uterus, including extraperitoneal drainage through the sectioned vagina.

The authors point out that extraperitonealization of the operative field for radical operation in cases of cancer of the uterus, rectum or bladder, accompanied by subperitoneal drainage, assures safety in a hazardous operation as well as a smooth postoperative convalescence.

The adjunct of preoperative transfusion and antibiotic therapy minimizes postoperative complications.

Volcker first pointed out the advantage of extraperitonealization in operations on the bladder. The technic described in this book is particularly applicable to radical cystectomy, because it affords high separation of the abdomen from the operative field, permitting extensive resection of the peritoneum, cellular and glandular tissue along with the bladder. Cystectomy is carried out in the same manner as for cancer of the uterus.

The 15 illustrations by Frantz are excellent, and the legends are printed in both French and English. There is also a summary of the book in English. The volume contains a preface by Alexander Brunschwig, who points out the advantages of the authors' technic. The bibliography contains the authors' previous publications pertaining to its development. Surgeons interested in radical pelvic surgery will find this volume well worth reading.

CHARLES PIERRE MATHÉ, M.D.

L'Anesthesie en Chirurgie Thoracique (Anesthesia in Thoracic Surgery). By Oliver Monod, Michel Herbeau, G. Delahaye, G. Chesneau, A. Juvenelle, F. Gautier and F. Lafay. Paris: Masson et Cie, 1955. Pp. 126.

This book has a preface written by Dr. P. Monlonguet and deals with various current methods of inducing and maintaining anesthesia for surgical treatment of thoracic lesions. The authors' experience is drawn from 1,000 operative cases observed from 1934 to 1954.

The various chapters into which the book is divided deal with (1) the evolution of anesthetic technic for thoracic operations; (2) incidents and anesthetic accidents: (3) technic and indications; (4) anesthesia for cardiac operations, and (5) induced hypothermia, blood transfusions (circulatory reanimation) and the use of the bronchoscope in thoracic surgical procedures. The book has value for all physicians who wish to acquaint themselves with the latest available information in this field.

HARRY FOURNIER, M.D.

Homotoxins and Homotoxicoses: Outline of a Synthesis in Medicine. By Hans-Heinrich Reckeweg, with an introduction by Karl Kötschau. Baden-Baden: Aurelia Publishing House, 1955.

The author who is well known by his articles published in *Münchener medizinische Wochenschrift,* develops in this book a new conception of medicine compatible with humeral, cellular and neural pathology, causation, and final teleology. He bases his work on results of experimental medicine, quoting innumerable papers, especially in the field of biochemistry and metabolism. Speculations are avoided, and sober self-criticism is evident everywhere. His carefully analyzed deductions from recognized scientific results seem extremely logical. Not only pathologic events but all manifestations of life are considered chemical reactions and therefore the chemical factors in these reactions are most important. He calls these chemical factors homotoxins, for they may have a toxic effect on man. The ingested homotoxins are particularly important in view of the character of the human organism, which and can be described as a fluent system through which the chemical factors stream and are absorbed, metabolized and eliminated. Among the homotoxins, the sutoxins (i.e., the homotoxins contained in pork) have paramount importance.

Reckeweg suggests that phenomena formerly called diseases are in fact the organized defense against homotoxins, and one must consider disease the expression of a useful biologic process. The pathologic events must be considered the chemical expression of a defensive battle against homotoxins which pass through six consecutive stages. The fluid system of the organism eliminates the homotoxins (first phase, or phase of excretion), transforms them (second phase, or phase of reaction) or deposits them temporarily (third phase, or phase of sedimentation; e.g., polypi, gallstones). The suppression of secretion, e.g., of axillary perspiration (phase 1) or of acne or rhinitis vasomotorica (phase 2) may lead to disastrous consequences. Here one sees the old teaching of quacks come true: "poisons must work out." Reckeweg emphasizes the fact that some bacteria even cooperate in the elimination of the homotoxins and particularly of

the sutoxins, and Claude Bernard's dictum "Le terrain est tout, le microbe n'est rien" is repeatedly quoted in this connection

Homotoxins, however, especially the retoxins (homotoxins that have been reabsorbed by a wrongly suppressed phase of reaction—for example, by treating acne locally only) may invade the finer structure of the cells, damaging either the terminal reticulum or the fermentative system (fourth phase, or phase of impregnation, e g , toxic neuritis, cellular lesions preliminary to the development of arteriosclerosis, Graves' disease, articular effusions and the commencing phase of exhaustion as in Seley's syndrome of adaptation

If the impact is particularly strong, complete breakdown of the cell structure may ensue (fifth phase, or phase of degeneration, examples, lupus erythematosus, disseminated sclerosis, amyloidosis of the liver, scleroderma, leukemia, osteoarthritis) Should carcinogenic toxins also be present the cell vested synthesis of proteins will be interfered with, and irregular cell-forms will occur as a result of lesions to the chromosomes and to the cytoplasm (sixth, or neoplastic phase)

Again and again the study reverts to the change of appearance and the variety of forms in the sphere of disease formation The author's notes on the vicarious homotoxic phases supply food for thought Here one obtains some explanation of the undesirable side effects of sulphonamides and antibiotics

During recent years concern has been aroused about the great increase in degenerative maladies, and it has been stated that, in spite of the great advance in the treatment of acute diseases, the ravages of degenerative conditions are enormous

The explanation, according to the expounded study of Homotoxins and homotoxicoses is that The essential tendency of organic life is to eliminate homotoxins and particularly sutoxins by biologically purposive phases of reaction Powerful drugs inhibit this process and these phases are transformed into phases of impregnation Finally, if carcinotoxins are present too, the neoplastic phase—the final phase of all homotoxins—is inevitable

This book is stimulating, and the highest praise must be given to a work that forces the reader to a line of thought different from the usual medical primers The student of the book will appreciate the remarkable fact that in the light of the theory of the homotoxins some points are completely elucidated for which previously no reasonable explanation existed and about which speculation brought no enlightenment This is true not only of rare diseases in teaching hospitals but of those commonly encountered in general practice

Students of natural science, biology and pharmacology, clinicians and practitioners are advised to study Reckeweg's theories I have the impression that this writer's study on homotoxins and homotoxicoses has opened a new epoch in the history of medicine, and its results already seem evident

ALBERT W BAUER, M D

Tumors of the Skin By Herbert Conway Springfield, Ill Charles C Thomas, Publisher, 1956 Pp 267, with 178 illustrations and 3 color plates

To this reviewer, *Tumors of the Skin* appears to be a summation of lectures the author has given in this particular field As such, it may offer a valuable service to students who wish to review the material For the average doctor, dermatologist or pathologist the book has no particular value

The text deals, in broad outlines, with gross and microscopic pathologic and clinical pictures and with the treatment of tumors of the skin

The bibliography, as the author himself states, is too brief for a book on such small particular subjects One could argue about the classification of some of the tumors mentioned, but there seems to be no doubt that, the foreign body granuloma, for instance, does not belong among tumors of the skin All in all, this reviewer's opinion is that the book has limited purposes Some of the reproductions certainly could be replaced by better ones

WERNER F EISENSTAEDT, M D

Diversion of the Urinary Flow into the Intestine. Uretero sigmoidostomy and Formation of an Artificial Bladder from the Intestine. By *H Boeminghaus* Stuttgart Georg Thieme Verlag, 1956 Pp 60, with 57 illustrations

This monograph consists of two parts In the first the author discusses briefly the history and the different methods of ureterointestinal implantation Many instructive illustrations accompany the text and facilitate one's understanding of it The chapter explaining the urologic and biochemical complications of this type of plastic surgery is exceptionally well written In the second part Prof Boeminghaus

describes the methods and indications for the formation of a substitute bladder and for vesicorectal anastomosis. An extensive bibliography is added.

To the urologist, of course, most of this matter is known; the book is a valuable guide, however, for the general surgeon who is faced with the problem of this kind of plastic surgery.

HANS BONIN, M.D.

One of the outstanding characteristics of Greek medicine (at the time of Hippocrates) was its freedom from superstition, magic, and witchcraft. Inevitably some of the Greek views on physiology and pathology appear fantastic to our enlightened eyes. Their fantasy does not derive, however, from any injection of superstitious element, but simply because the wide-ranging intelligence, rising superior to all ideas of experimentation or proof, launched itself into the working fields of imaginative speculation on wings that were scarcely suited to these flights. Some of their guesses —perhaps a kinder word than speculations—came near to the atomic theory and the bacterial causes of disease. All in all, then, it was relatively easy for the Greek physician to be a sane and honest practitioner of his art, serving his patients to the best of his ability, and relying largely on his simple therapy and the beneficent operation of the *vis medicatrix naturae.*

—Charles

Abstracts from Current Literature

Scientific Basis for the Surgical Treatment of Coronary Artery Disease Leighninger, D S, and Beck, C S JAMA 159.1264, 1955

Uniform distribution of oxygen to the myocardium produces an electrically stable heart, lack of this uniformity produces an unstable heart Differences in electrical potentials of the heart are produced by "oxygen differentials" A *uniformly cyanosed heart is not injured or* unstable Operation relieves symptoms in 9 out of 10 patients So far the trend of experience seems to indicate that operation prolongs life Operation adds 282 cc of blood per hour to an ischemic myocardium, and this blood is present at the crisis of arterial occlusion This is comparable to a transfusion of arterial blood into ischemic muscle There is no experimental evidence to indicate that medical therapy adds a single drop of blood to ischemic myocardial areas or subtracts a single drop therefrom In view of this limitation, the patient with disease of the coronary artery should be told that there is a more effective treatment Operation should be done early in the course of the disease, before irreparable damage occurs in the myocardium

The operation has limitations that, if properly understood, will make its beneficial effects more readily acceptable It does not treat coronary arteriosclerosis, it treats alterations of inflow produced by the disease It therefore does not reduce the disease in the arteries, nor does it stop its progress Indeed, the disease may become more marked after the operation A similar statement may be made about the myocardium Operation does not restore an *infarct to a functional* myocardium, it does, however, reduce the size of the infarct or even prevents the formation of an infarct if another artery becomes occluded It is possible for the symptoms to become worse in a patient who has shown clinical improvement after the operation This is brought about by the progress of the arterial occlusion, so that it is possible for the patient to be in worse condition clinically at some time after operation, yet the operation has saved his life The patient may die of coronary disease at some time after the operation, but the experience so far seems to indicate that the operation prolongs life.

WILLIAM E NORTH, M D.

The Present Possibilities of Cardiac Surgery Under Hypothermia Du Bost, C, and D'Allains, C, Nahas, G, Mathis, P, Guillemin P, Guillemot, R, Espagno, G, and Esclavissat, M, J de chir 71. 285 308, 1955

This article is a detailed report of experimental work on cardiac surgery with hypothermia at the Hospital Broussais (service of *Professor F d'Allaines)* and at the Hospital Marie Lannelongue, Paris, with the aid of grants from the French National Center for Scientific Research and the National Chest Social Security The authors conclusions are as follows

1 At present, hypothermia permits the opening of the heart and the performance of operations within its cavities This is a wonderful accomplishment but is still possible only under *strict limitations These limits* are (1) the temperature cannot go below 26 C without serious danger, (2) The vessels cannot be safely clamped off longer than twelve minutes or, at most, fifteen minutes, (3) It is risky to operate on a cyanotic child or on a patient in a state of chronic hypoxia, and (4) Ventriculotomy carries more danger of fibrillation than does auriculotomy

2 Only a few procedures therefore, are possible as yet Nevertheless, closure of the foramen ovale and valvuloplasty for valvular pulmonary stenosis are feasible and have been performed with good results in the United States (Swan, Lewis, Bailey)

3 To *obtain worth while results, it is* necessary to be able to open either the right or the left cavity for fifteen to forty five minutes and operate under tranquil conditions

To this end, several possible solutions must be studied

1 To arrest the circulation for thirty minutes it is necessary to maintain a temperature of around 15 C At such a temperature cardiac disturbances are serious and it probably will *not be possible to accomplish* this in man without excessive risk According to Laborit and his collaborators, artificial hibernation may accomplish the purpose, since it is more physiologic than simple refrigeration

2 *Cardio cerebral Perfusion* In perfusing the coronaries and the carotids at 25 C circulatory arrest of three-quarters to one hour is possible But these perfusions necessitate three

times as much blood as does the coronary. Large amounts of blood will be required before being oxygenated and heparinized. This is the chief obstacle to its practical application. There exist other less serious, such as:

(a) The necessity of retrieving an amount of cerebral venous return equal to that delivered and (b) the necessity of interrupting the circulation in the two subclavians in order to perfuse only the carotids. At the moment the authors are studying this problem in the dog. (c) These two points, being purely matters of technic, are easily resolved.

3. Use of the artificial heart-lung in combination with cold is perhaps simpler than is cardiocerebral perfusion or arterial blood. At low temperature, only minimal replacement will be required (about 700 cc. at 30 C., 500 at 25 C.). This procedure is also receiving the authors' attention.

4. There is a fourth procedure, the possibilities of which are now being studied. Parkins and his collaborators have shown that it is possible to cool off the brain much more effectively than the rest of the organism by *reinjecting cooled blood* into one of the common carotids. The cerebral temperature may thus be reduced to 18 to 14 C. while the rest of the organism remains between 32 and 28 C. as revealed by the rectal thermometer. This procedure has the following advantages: (a) The cerebral circulation can be interrupted for thirty to forty minutes; (b) At 30 C., metabolic disturbances and cardiac insufficiency are minimal, and (c) a coronary perfusion allows complete arrest of the circulation for thirty minutes at least, without cardiac or peripheral circulatory disturbances. It has not been proved however, that this cooling off is devoid of danger from cerebral ischemia.

At present it is possible to envisage cardiotomies lasting from thirty to forty-five minutes. On the basis of experimentation on 68 dogs, the authors show that hypothermia may be attended with metabolic disturbances and progressive cardiac insufficiency that rapidly becomes dangerous, predisposing to ventricular fibrillation. The cooling-off process may be rendered somewhat less dangerous by Swan's method, yet reduction of temperatures to below 25 C. remains risky.

ULYSSES GRANT DAILEY, M.D.

Triethylene Melanine in the Treatment of Far Advanced Ovarian Cancer. Sykes, M. P., Rundles, R. W., Pierce, G., and Karnofsky, D. A., Surg., Gynec. & Obst. 101: 133, 1955.

The authors employed triethylene melanine in the treatment of 6 patients with far advanced ovarian cancer. Fourteen obtained some degree of symptomatic improvement, and 8 of this group showed objective evidence of regression of the tumor. The usual duration of improvement ranged from one to three months. One patient showed benefits for eleven months, and another has shown no evidence of recurrent disease for four years. In the latter case this result may be due to a spontaneous remission. On the basis of these observed responses, the authors conclude that an adequate trial of triethylene melanine or a related compound is indicated for patients with a nonresectable or recurrent ovarian cancer. This drug may be administered concurrently with roentgen therapy, or it may be administered before or after this type of therapy.

EDMUND LISSACK, M.D.

13 Observations de greffes d'artères des membres en chirurgie de guerre d'urgence. (Thirteen Cases of Arterial Grafts of the Limbs in Wartime Surgery). Lahitte, F. G., Aulong, J., and DeLarue, J.: J. de chir 72: 277, 1956.

It is surprising that in spite of numerous cases of reconstructive vascular surgery, the number of emergency arterial grafting operations performed in wartime is small.

During the Indo-China conflict, the authors, since 1954, have extended the scope of reconstructive surgical treatment to emergency cases.

Out of different varieties of arterial lesions and corresponding operations, 13 cases of primary arterial grafts of the arms and legs are studied. The list includes the following vascular injuries: 7 popliteal or femoropopliteal, 3 femoral and 3 humeral.

In 8 cases the results were excellent. One patient died of associated abdominal injuries; 3 had to undergo secondary amputation.

The grafts used were banked arterial homografts in 10 cases, fresh arterial homografts in 2 and a venous autograft in 1. Net preference is given to preserved homografts.

The importance of a good systolic pressure in the postoperative period is underlined. In disagreement with the American experience in Korea, the authors prefer grafting to terminoterminal anastomosis.

It is difficult to arrive at a time lapse within which operation should be performed. It is

always good to try and save the limb, but if there is advanced ischemia it is useless to operate, and the dangers incurred by a graft inserted in poor tissue must be seriously considered

The fact that vascular injuries must take prime priority in emergency is stressed, and the organization of wartime vascular surgical units is stressed

S GUEUKDJIAN, M D

Whiplash Injuries Lipow, E G, Southern M D, 48: 1304, 1955

A whiplash injury is that which results from forcible flexion of the cervical spine that follows sudden acceleration forward from a position of rest and the attending elastic rebound with consequent hyperextension It usually happens when the automobile in which the patient is sitting, e g, when stopped by a traffic light, is hit from behind with force It can also occur when a vehicle stops suddenly and the patient is thrown forward In such cases the forces that cause this injury are hyperextension and, immediately thereafter, an overcorrected whiplash hyperflexion Other causes are a violent slap on the back, clipping and body blocking in football, and falling down steps or escalators By all odds the commonest cause, however, is collision from behind Of 50 consecutive cases, collision from behind with a stopped vehicle in front was responsible for the injury in 78 per cent The greatest amount of flexion and force is in the so called movable portions of the spine, i e, the cervical and the lumbar Most of the symptoms followed by the authors stem from injuries in and around the third, fourth and fifth lumbar, based on clinical findings The 50 cases reported in this paper were selected, because of (1) lack of roentgenologic data other than straightening of the cervical curve, (2) minor or complete absence of any associated previously existing conditions in the neck or back, and (3) absence of a history of any prior similar injury

The pathologic picture after the injury consists essentially of disruption of the normal anatomic status by avulsion, fracture, hemorrhage, laceration and encroachment on normal structures Hemorrhage may occur in the soft tissues of the neck and around the nerve trunks A permanent arrest of bleeding may be accomplished by the formation of an inflammatory exudate consisting mainly of lymph which in due time becomes firmly organized and converted into granulation tissue This causes adhesions and pain because of its proximity to the peripheral nerve fibers Partial avulsions and ruptures of the muscles and tendons of the neck may occur, and when healing does take place the muscle may remain incompletely healed or partially replaced by fibrous tissue The tendon rupture may show bridging by tendon tissue, but with the bridging and healing there is often shortening Because of the mechanism of the injury, traumatic cervical radiculitis is not uncommon Edema is present, and pressure from this source in or around the neural foramens will cause a moderately long-lasting nerve irritation Avulsion fractures of the spinous processes, fractures of the articular facets and dislocations of vertebrae also occur The author limits his discussion in which there is a "negative x ray picture" ("negative" that is, except for unusual straightening of the normal curvature) and in which bony disease is absent It is of great moment, however, to know whether there has been any previous disease of bone, such as osteophytic change, arthritis, or destruction of the intervertebral cartilage, with consequent narrowing of the intervertebral space In such circumstances it is obvious that the symptoms and, indeed, exacerbation of a previous condition can be a serious complication

Concussion is interpreted as a sudden mechanical deformity that results when the forward movement of the brain is suddenly arrested against the anterior wall of the cranium This condition may further cloud the picture If the injury is such as to cause protrusion of the nucleus pulposus, symptoms of cervical disc will be noted When all of these injuries are essentially untreated, a cervical syndrome is reached which, of course, is sometimes most difficult to treat

The treatment of whiplash injuries must be directed toward elimination of the most important symptoms, e g, elimination of spasm of the neck and shoulder muscles is imperative Heat (hot packs, luminous heat, infra-red rays, short wave therapy and microtherm therapy) is useful This is followed in most cases by cervical traction in the hospital, the office or the patient's home If used in the hospital, with complete bed rest, 5 to 12 pounds (2 3 to 5 4 Kg) of traction is used more or less continuously twenty-four hours a day and is removed only for eating and for unnece
long-continued discomfort I
overhead traction to 60

applied for short periods, much as it is used for the cervical syndrome. This treatment is supplemented at home by head traction up to 15 pounds (27.2 Kg.). Each case is highly individualized, and the length, duration and amount of traction are adjusted for each patient. The author has had to use a Thomas collar in the cases he reports, though the Lewin collar at the beginning of treatment has been used with much comfort to the patient.

Muscle relaxants of the mephenesin group are well tolerated and useful. They have been employed in each of the cases reported. When spasm was severe and in cases of bed traction, repository tubocurarine, Tubadil, was employed in intramuscular doses of 1 to 2 cc., with excellent results. Analgesics, such as aspirin and codeine, were used in the early phases of treatment in many cases. As soon as spasm had been controlled, it was seldom found necessary to continue any other analgesics except para-aminosalicylic acid and then only for headache. Sedation by means of the barbiturates was used sparingly.

Injections of 10 cc. of 1 per cent solution procaine hydrochloride into acutely tender areas and to trigger points were used in 26 cases (52 per cent). When these tender points are made less painful, spasm is more quickly eliminated and recovery is hastened. In some cases paravertebral cervical blocks were done to eliminate paresthesias of the upper part of the arm.

In every instance the case was fully discussed with the patient and the neurologic symptoms and the depressive state explained. The patient was encouraged to help the physician; in most cases he was glad to do so and felt that he had a part in curing himself. Only 2 patients showed such strong psychoneurotic tendencies as to require the services of a psychiatrist. In the other instances the patient became adjusted to his injury rather early, and in only 6 cases (12 per cent) was it the impression that the psychoneurosis, which was mild, was unimproved after there had been other maximum benefits in management.

An average time loss of fourteen and eight-tenths days per case is a distinct economic hardship. The author has observed that the time lost from work varies inversely with the time at which treatment was instituted after the accident. There are individual variations, of course, but on the whole the rule works out rather constantly. It was also noted that the number of treatments varied directly with the severity and extent of the injury but was even more closely related to the interval between the accident and the beginning of treatment. Eighty-four per cent of the patients began treatment within twenty-four hours, and approximately 88 per cent were either cured or improved after a period of management.

In many cases of whiplash injury, compensation and litigation procedures affect the patient's real and apparent recovery. Too often the victims of the usual type of accident (collision from behind) have been told by friends and attorneys that they were in the right and are "entitled to damages." They are often encouraged to continue complaining so as to build up a demand for larger compensatory emoluments, and unless this particular factor is kept in mind and the patient's clinical progress is carefully evaluated, unnecessarily prolonged treatment may result. This in itself may subsequently lead to a mild depression or even a psychoneurosis. Malingering may be attempted, and it is indeed a difficult situation to determine where the real complaints leave off and conscious exaggerations begin. Complete records and progress notes are valuable in dealing with this problem; they also make reports and court procedures less troublesome and arduous, not to mention the help they give in treating the patient which, of course, is the surgeon's primary object. Some method of evaluating disability from this condition, during both the active stage and the residual state, if any, should be devised and agreed upon between the responsible persons.

The prognosis of this type of injury on the whole is good. Even if mild depression develops the outlook is not unfavorable, provided treatment is begun early. It must be pointed out, however, that the unrecognized condition may lead to protruded or degenerated intervertebral discs, chronic strain, so-called fibrositis or myofibrositis of the posterior neck, shoulder, and upper back muscles, unhealed fractures of the spinous processes and traumatic segmental chronic radiculitis. Even rather severe psychoneuroses, out of all proportion to the clinical abnormalities, have been reported. It must be remembered, however, that a cure can be expected if proper treatment is started early.

WILLIAM E. NORTH, M.D.

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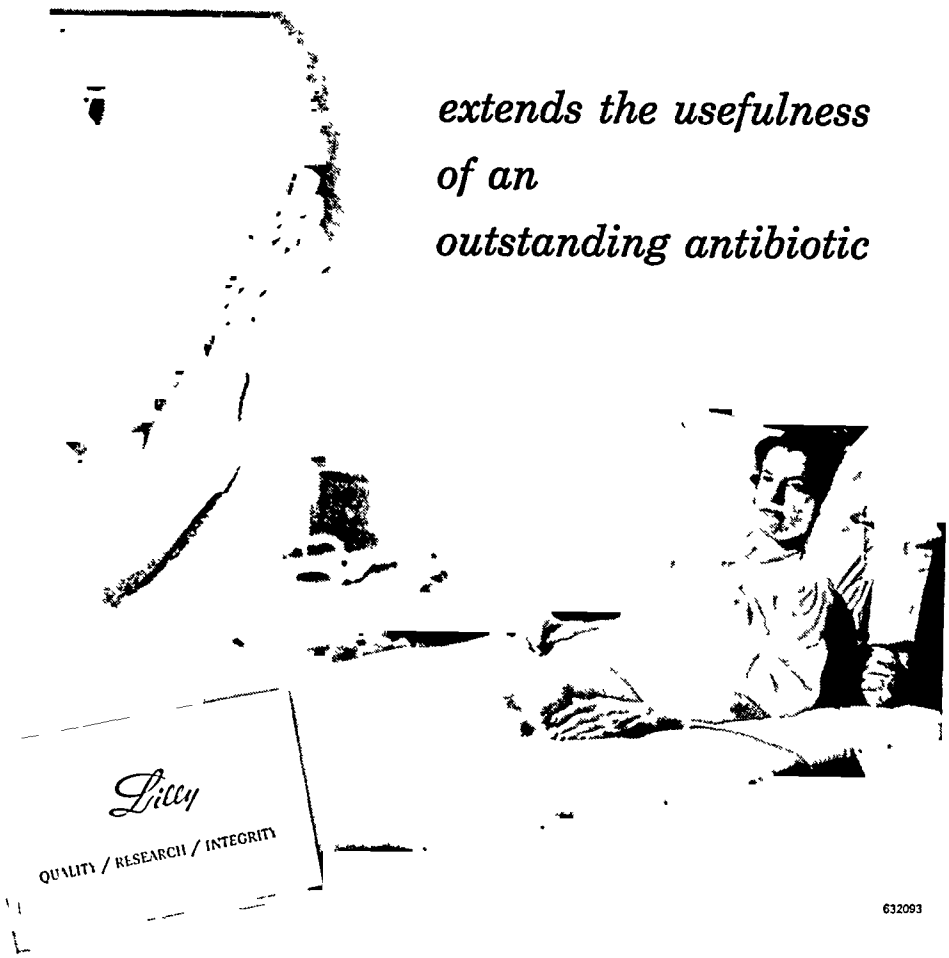

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General Surgery

Resection of the Liver with Intrahepatoductogastrostomy or Intrahepatoductojejunostomy for Biliary Obstruction

A. M. DOGLIOTTI, M.D., F.A.C.S., F.I.C.S. (Hon.),*
AND E. FOGLIATI, M.D.**
TURIN, ITALY

WE have studied and performed, since 1946, an operation we call intrahepatoductogastrostomy for extensive and serious destruction of the common bile duct, when it is impossible to locate the hepatic stump, in order to reconstruct a bile passage or to perform hepaticojejunostomy. Only after some time did Longmire publish a similar method.

This operation, especially well known in France and Italy, consists of subtotal resection of the left lobe of the liver and anastomosis of the left intrahepatic lobar duct to the stomach.

Recently we have introduced a variation of this method, consisting of intrahepatoductojejunostomy and resection of only the anteromedial segment of the left hepatic lobe.

*Professor of Surgery and Director of the Surgical Clinic, University of Turin
**Assistant, University of Turin
Submitted for publication May 20, 1956

In order to accomplish these surgical procedures for intrahepatoductoenterostomy it is absolutely necessary that a sufficient communication should exist between the biliary systems of the two main lobes of the liver. This condition does exist in the majority of cases, generally because the destructive process ends at the hepatic hilum. The hepatic stump is usually protected by the vascular formations that collect in the hilum.

In these cases the intrahepatic biliary ducts are dilated as a result of the obstruction, and this factor favors anastomosis of the biliary and digestive tracts.

First Method: Intrahepatoductogastrostomy.—A few days before the operation the patient is prepared with abundant hepatoprotective drugs (metionin, coline, liver extracts, vitamins and dextrose) and antibiotics (penicillin, streptomycin and eventually terramycin). It is well known that the virulence of the hepatic bacterial flora increases when biliary obstruction is present.

The anesthesia of choice is the segmental peridural type induced at the seventh or eighth dorsal interspace, or gas-oxygen general anesthesia.

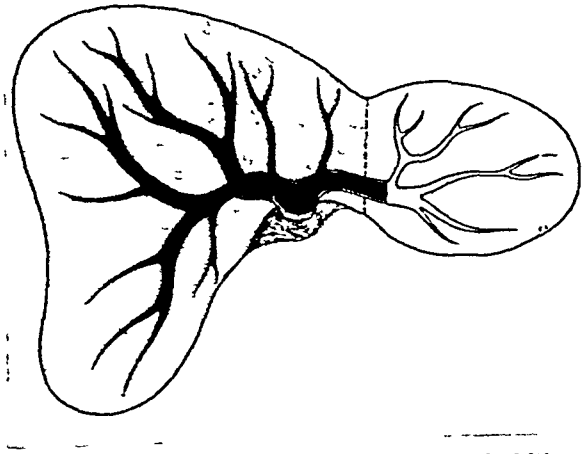

Fig. 1.—Total destruction of extrahepatic biliary ducts. Stump of hepatic duct is retracted toward hilum of liver, protected by a heap of scar tissue; biliary communication between the two large lobes of the liver is preserved. Section line of left lobe is dotted; part to be resected has been left white.

During the surgical procedure whole blood, saline or dextrose solutions are infused by the continuous drop method.

The operation consists in resection, on the anteroposterior sagittal plane, of two-thirds of the left lobe of the liver and the insulation of 1 or 2 cm. of a large left lobar biliary duct, which is located in the anteroinferior part of the left lobe, and its anastomosis to the anterior wall of the stomach (Figs. 1, 2 and 3).

On account of the subtotal resection of the left hepatic lobe, anastomosis of the intrahepatic biliary duct to the gastric wall instead of the jejunum is necessary, for the following four reasons:

1. The anastomosis is not subject to traction, since the stomach is placed very near to the liver.

2. On account of its large surface, the stomach is ideal to cover the large wounded liver surface and also to protect the anastomosis.

3. The gastric contents are relatively aseptic.

4. The thickness of the gastric "muscularis" acts as a sort of sphincter of the intrahepatic biliary duct, thus preventing the reflux of alimentary material.

The adoption of a median supraumbilical laparotomy, lateralized downward and to the right of the umbilicus, offers great possibilities for maneuvering during the operation.

After section of the round ligament where it emerges from the liver, the falciform ligament and the left part of the coronary ligament, the left lobe is isolated from its connections to the diaphragm. Introducing one hand between the diaphragm and the upper surface of the liver, the left lobe, which is enlarged because of the bile stasis, is hooked and pulled delicately into sight.

The wound is protected with sterile

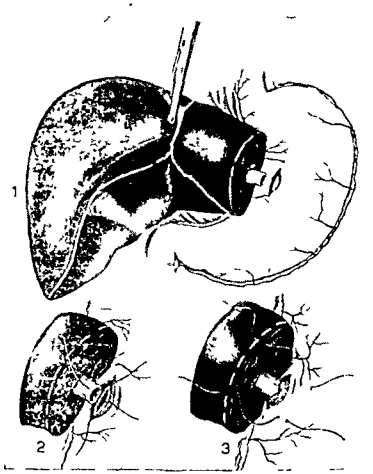

Fig. 2.—Intrahepatoductogastrostomy technic: *1*, lateral two-thirds of left hepatic lobe has been cut on an anteroposterior plane; stump of main lobar biliary duct and small incision made in the gastric wall, to be anastomosed with duct, are clearly visible. *2*, after parenchymal hemorrhage has been checked with U-shaped stitches, posterior and anterior sutures are started between stump of intrahepatic duct and small incision made in gastric wall. *3*, biliogastric anastomosis completed. A few stitches to fix wall of stomach to perihepatic capsule of upper aspect of liver will be made; this suture will guarantee perfect stability and protection to biliogastric anastomosis.

towels, and subtotal resection of the left lobe of the liver is performed.

For temporary hemostasis of the liver tissue during the resection, we have discarded the possibility of compressing the hepatic peduncle, where the hepatic artery and the portal vein are situated, because we all know too well the extreme sensitivity of the hepatic cells to anoxia, especially in the presence of pathologic conditions.

If the left lobe of the liver has been sufficiently dislocated, an assistant can assure temporary hemostasis by compressing, between the middle and index fingers of the two hands, the base of the lobe to be resected. In case this maneuver is difficult, on account of the particular conformation of the chest or the excessive enlargement of the hepatic lobe, we apply a special clamp with large elastic branches that compress the base of the lobe and so favor hemostasis. The hepatic parenchyma is then neatly incised with a bistoury: the larger vessels are tied separately by transfixion, and the parenchymal hemorrhage is easily controlled with U stitches through the liver, care being taken not to compress the area corresponding to the biliary duct to be anastomosed. Having located the largest biliary duct, which is usually in the anteroinferior portion of the base of the lobe, we insulate it from the surrounding tissues for a few centimeters in order to control its perviousness. The smaller biliary ducts are closed by transfixion with silk stitches. When hemostasis of the sectioned parenchyma is satisfactory, we proceed with the terminolateral anastomosis, generally by the guidance of a polyethylene fenestrated tube between the free and the isolated duct and the anterior wall of the stomach.

We start by fixing the gastric wall near

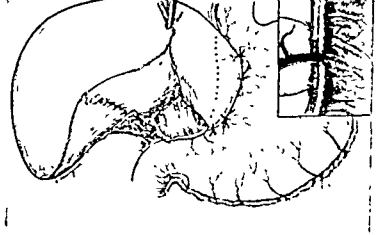

Fig. 3.—Intrahepatoductogastrostomy technic. Operation completed; anterior portion of stomach has been sutured to perihepatic capsule of upper aspect of liver. On top and at right, sutures are visible on section.

the smaller curvature to the anterior margin of the sectioned liver.

After pinching a fold of the anterior stomach wall where it is safest and most convenient, in order to avoid traction on the anastomosis, we squeeze it gently between the branches of a small elastic compressor and create a buttonhole measuring 1 cm.

The stump of the intrahepatic duct, from which bile continues to flow, is then sutured to the small buttonhole made in the wall of the stomach.

Suturing is done with thin silk stitches, in two layers, and is guided by the fenestrated polyethylene tube. The first layer draws the border of the sectioned duct to the mucosa of the stomach; three stitches are sufficient for the posterior wall and the same number for the anterior wall. The second layer consists of supporting stitches between the muscularis of the stomach and the bile duct and serves to reinforce the mucose suture.

Finally, the wall of the stomach is fixed to the perihepatic capsule of the upper border of the liver section, so as to cover the sectioned surface of the viscera completely (Figs. 3, 4 and 5).

Since in some cases, some time after the operation, we have been obliged to reoperate on the patient to remove the obstructed polyethylene tube, we have modified the original method:

After completion of the suture of the posterior wall of the biliogastric anastomosis, a second incision is made a few centimeters from the first gastric incision, through which a polyethylene fenestrated tube is passed to a length of 7 or 8 cm.

The fenestrated portion of the polyethylene tube is introduced 4 or 5 cm. into the lumen of the intrahepatic biliary duct, but it juts into the gastric cavity. After completion of the suture between the biliary duct and the stomach, a tobacco-purse suture is performed on the incision through which the polyethylene tube projects, and the stomach is fixed to the anterior abdominal wall, as in a gastric fistula.

This internal and external draining tube is extremely useful, because, when one has to deal with patients who have intense and severe jaundice, the bile is rapidly eliminated from the body through the external end of the tube; many germs and toxins are therefore eliminated. This tube also acts as a gastric sound, because the gastric portion is fenestrated.

When jaundice has almost disappeared and intestinal peristalsis becomes normal, the external part of the tube is closed. Thus all the bile flows through the lateral holes of the tube into the stomach, and we avoid the loss of electrolytes and gastric secretions. Twenty days after the surgical procedure, when cicatrization of the intrahepatic duct and the gastric mucosa is complete, the drainage tube is removed without danger of creating fistulas.

Second Method: Intrahepatoductojejunostomy with Resection of the Anteromedial Segment of the Left Lobe of the Liver. —The aim of the second type of operation is identical with that of the first: to renew the flow of bile into the intestine when all the extrahepatic bile ducts have been destroyed.

After a wide technical experience with intrahepatoductogastrostomy, some considerations induced us to perform the intrahepatoductojejunostomy with economical resection of the liver. Factors leading to these modifications are as follows: (1) the not indifferent amount of liver tissue to be resected from a seriously ill viscus with reduced functional efficiency; (2) a certain technical difficulty in performing the operation, which involves dislocation of the left hepatic lobe from the subphrenic space; (3) the amount of time required for hemostasis of the large sectioned surface of the liver, which is congested and friable; and (4) the fact that the left lobe

of the liver consists of three segments, the laterosagittal, the posteromedial and the anteromedial, and that each one is drained by its proper segmentary biliary duct.

Considering all these facts, we consider it useful to resect the anteromedial segment of the left hepatic lobe and to anastomose the segmental duct to the jejunum (the stomach, in fact, is far away from the point of resection; see Figures 4 and 5).

On the anterior border of the liver, 4 to 6 cm. to the left of the round ligament, we perform a truncated cone resection of the liver from the anterior to the posterior surface; this resection should be 7 or 8 cm. wide and 4 or 5 cm. deep. After hemostasis has been obtained with parenchymal piercing stitches, we find a large bile duct in the anteromedial segment and isolate it for at least 1 cm.

We then locate a jejunal loop about 30 cm. from the Treitz ligament and, pulling it upward, pass it in front of the transverse portion of the colon to the sectioned surface of the liver. The jejunal loop is fixed to the perihepatic capsule of the lower margin of the liver with single silk stitches. The jejunal loop is opened longitudinally for about 1 cm., and we proceed to the posterior suture between the intrahepatic bile duct and the jejunal mucosa. The posterior suture having been completed, the bile duct is intubated with a fenestrated polyethylene tube, jutting about 10 cm. into the efferent jejunal loop. After completing the anterior part of the mucous suture, we fix the intestinal "muscularis" to the duct wall with single silk stitches, and the jejunum is sutured to the perihepatic capsule of the upper edge of the liver, in order to take the jejunal loop firmly up to the liver and also to give further protection to the biliary-digestive suture.

The loop anastomosed to the liver is excluded by a Brown enteroenteroanastomo-

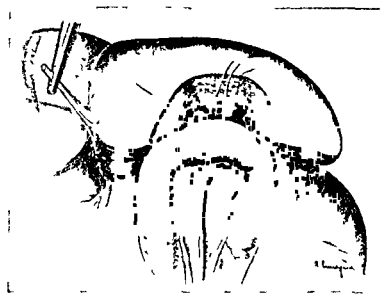

Fig. 4.—Intrahepatoductojejunostomy technic. An economical resection in form of truncated cone has been made in anterior portion of left hepatic lobe. A jejunal loop has been fixed to perihepatic capsule of lower edge of liver; suture between an intrahepatic biliary duct and small jejunal button hole is being started; fenestrated polyethylene tube is used as a prosthesis to the biliojejunal suture.

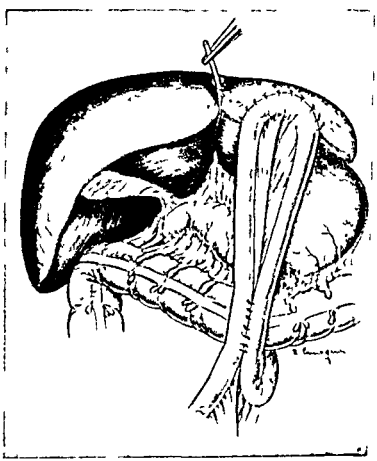

Fig. 5.—Intrahepatoductojejunostomy technic. Operation completed; jejunal loop anastomosed to intrahepatic biliary duct has been fixed to perihepatic capsule of upper edge of liver. A latero-lateral enteroenteroanastomosis has been made at foot of loop anastomosed to liver, to shut it out from passage of foods.

sis, to avoid the danger of ascending cholangitis or alimentary reflux and also to facilitate passage of the intestinal contents.

We wash the operative field with warm saline solution. After spreading sulfa and antibiotic drugs on the operative field, we drain the subhepatic space with a rubber tube.

The laparotomy incision is closed in layers with strong single silk stitches.

The intrahepatoductojejunostomy with economical resection of the liver is a more rapid and less traumatic operation; yet, despite the fact that a larger quantity of liver tissue is preserved, we obtain good results.

Since 1946 I have performed 10 hepatic resections followed by intrahepatoducto-enterostomy, which I shall report briefly.

REPORT OF CASES

CASE 1.—In 1946 Maria B., aged 49, underwent cholecystectomy for cholelithiasis. There remained an external biliary fistula, followed by the onset of total jaundice. During the surgical procedure we discovered almost total destruction of the common bile duct. The left hepatic lobe was resected and an intrahepatoductogastrostomy performed. The patient made a complete recovery and at the time of writing is up and about, feeling very well.

CASE 2.—In 1949 Annunziata M., aged 49, had jaundice after a cholecystectomy and underwent two additional unsuccessful surgical procedures to reestablish the flow of bile into the intestine. At operation we observed complete destruction of the common bile duct and severe hepatic cirrhosis. The left lobe of the liver was resected and an intrahepatoductogastrostomy performed. The result was not satisfactory, because there remained an external biliary fistula.

CASE 3.—In 1949 Angela C., aged 30, had persistent total jaundice following cholecystectomy. Having observed complete destruction of the hepatocholedochus, we performed an intrahepatoductogastrostomy. The patient gained 8 Kg. in weight, but noticeable hepatomegaly still persists and subjaundice is still present, probably due to failure of confluence of the various hepatic ducts.

CASE 4.—In 1950 Fede G., aged 23, had total traumatic destruction of the main bile passage following cholecystectomy, as well as serious jaundice. At operation we discovered a communicating fistula between the hilum of the liver and the transverse portion of the colon. Subtotal resection of the left hepatic lobe, followed by an intrahepatoductogastrostomy, produced a good and lasting result.

CASE 5.—In 1950 Cesira F., aged 42, having previously undergone cholecystectomy and later, fistulogastrostomy because of an external biliary fistula, was operated on for total jaundice. At operation we noted an obstruction of the fistula anastomosed to the stomach and complete destruction of the hepatic duct and the choledochus. The left hepatic lobe was resected and an intrahepatoductogastrostomy performed. Good results were obtained.

CASE 6.—In 1952 Ines R., aged 41, had subtotal destruction of the bile passages after cholecystectomy and serious biliary cirrhosis. After resecting the left lobe of the liver, we performed an intrahepatoductogastrostomy. The patient died of hepatic coma after three months.

CASE 7.—In 1953 Maria C., aged 35, had serious postcholecystectomy jaundice. A second operation failed to yield good results. At the third operation we observed destruction of the extrahepatic bile passages. We performed subtotal resection of the left lobe of the liver, followed by an intrahepatoductogastrostomy. An optimal and lasting result was obtained.

CASE 8.—In 1955 Greca B., aged 59, had total destruction of the extrahepatic bile ducts after cholecystectomy. At operation we noticed a deep alteration of the left hepatic lobe, due to chronic bile stasis. Subtotal resection of the left hepatic lobe was performed, followed by intrahepatoductogastrostomy. Two months later the patient died of hepatocholangitis with a biliary fistula.

CASE 9.—In 1954 Luigia V., aged 20, after cholecystectomy, showed complete destruction of the biliary passages, chronic bile stasis and a greatly enlarged liver. An intrahepatoductogastrostomy was done, with economical hepatic resection. Although subjaundice of the sclerae persisted, the patient gained weight and, at the time of writing, is still in good physical condition.

CASE 10.—In 1955 Giovanni T., aged 32, underwent cholecystectomy for cholecystitis complicated by jaundice. Biliary obstruction persisted, and choledochojejunostomy was performed. At laparotomy we observed obstruc-

tive fibrosis of the entire hepatocholedochus. We obtained a good result by performing an intrahepatoductojejunostomy, after resecting the anteromedial segment of the left hepatic lobe. The jaundice disappeared rapidly and completely. Six months later we reoperated on this patient to remove the obstructed polyethylene tube.

COMMENT AND CONCLUSIONS

In these 10 cases we obtained the following results: 3, very good, 2 good and 3 moderate. Two patients died two or three months after the operation, as a result of an external biliary fistula and serious hepatic lesions.

The operation itself was never the sole cause of death, and we were surprised to observe that patients so ill with chronic bile stasis could recover perfectly from so serious a procedure.

As to the technic of the surgical procedure, the use of the polyethylene tube noticeably facilitates the anastomosis between the intrahepatic ducts and the stomach or intestine; this tube assures the perviousness of the surgical fistula in the immediate postoperative course. Since this polyethylene tube may easily become obstructed, it is convenient to adopt all the technical ideas we have suggested, which permit its easy extraction, two or three months after the operation.

When destruction of the extrahepatic bile ducts was not too old, and, consequently, the hepatic alterations were lesser, recovery was complete and definitive, without any danger of cholangitis due to alimentary reflux into the intrahepatic bile ducts.

In patients operated upon for intrahepatoductogastrostomy, roentgen control films, taken after oral introduction of fluid barium, have never shown reflux; this confirms our hypothesis that the muscular layer of the stomach, so thick and strong, forms a sort of sphincter and protective valvule at the level of the biliodigestive anastomosis. With intrahepatoductojejunostomy, the alimentary reflux toward the liver is prevented by the enteroenteroanastomosis at the foot of the anastomosed loop to the intrahepatic duct.

SUMMARY

The authors describe the technic of performing an intrahepatoductogastrostomy and an intrahepatoductojejunostomy, with resection of the anteromedial segment of the left lobe of the liver. The cases of 10 patients are presented and the results discussed.

These two operative methods represent all the possibilities of intrahepatoductoenterostomy in cases of complete destruction of the extrahepatic biliary ducts.

RIASSUNTO

L'autore descrive la tecnica per eseguire l'intraepaticodottogastrostomia e l'intraepaticodottodigiunostomia con resezione del segmento anteromedialle del lobo sinistro del fegato. Vengono presentati e discussi dieci casi personali.

Questo metodo operatorio consente di eseguire la intraepaticodotto enterostomia in ogni caso di distruzione completa dei dotti biliari extraepatici.

RÉSUMÉ

L'auteur décrit la technique opératoire d'une intra-hépato-ducto-gastrostomie et d'une intra-hépato-ducto-jéjunostomie, avec resection du segment antéro-médial lu lobe hépatique gauche. Dix cas sont présentés et discutés.

Ces méthodes opératoires présentent toutes les possibilités d'une intra-hépatoducto-entérostomie dans les cas de destruction complète des voies biliaires extrahépatiques.

RESUMEN

Los autores describen una técnica de hepatogastroanastomosis y de hepatoyeyunoanastomosis, con resección de la parte anterointerna del lóbulo hepático izquierdo. Se presentan y comentan diez casos.

Mediante estos métodos quirúrgicos se cubren las posibilidades de hepatoenteroanastomosis en los casos de destrucción completa de la vía biliar extrahepática.

SUMARIO

Os autores descrevem a técnica de perfurção de uma intrahepatoductogastrostomia e de uma intrahepatoductojejunostomia, com ressecção do segmento anteromedial do lobo esquerdo do fígado. Apresentam e discutem os casos de 10 pacientes.

Esses métodes operatórios se apresentam com tôdas as possibilidades da intrahepatoductoenterostomia nos casos de destruição completa dos ductos biliares extrahepáticos.

ZUSAMMENFASSUNG

Die Verfasser beschreiben die Technik zur Herstellung einer Anastomose zwischen den intrahepatischen Gallengängen und dem Magen oder Jejunum mit Resektion des vorderen medialen Segments des linken Leberlappens. Zehn Krankheitsfälle werden dargestellt und erörtert.

Diese Operationsverfahren bieten alle Möglichkeiten zur Anlage einer Anastomose zwischen den intrahepatischen Gallenwegen und dem Dünndarm in Fällen von völliger Zerstörung der extrahepatischen Gallengänge.

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The inoculation of the smallpox was of Mahomedan origin, and was practiced on a superstitious principle, long before it was introduced as a rational practice in England . . . What tended very much to favor the new operation was the havoc that the natural smallpox had made with royal and noble persons.

—*William Wadd*, circa *1827*

Saint's Triad: Hiatus Hernia, Gallstones and Diverticulosis

A Surgical Problem

I. ARNOLD JAFFE, M.D., AND FERDINAND F. SZABO, M.D.*

BRONX, NEW YORK

DR. C. J. B. MULLER,[1] radiologist at the Johannesburg General Hospital, first discussed, in 1948, the association of gallstones, hiatus hernia and diverticulosis as a triad, with a description of 3 cases. He called these three entities Saint's triad. Dr. Muller's introductory paragraph reads as follows: "During last year Prof. Saint of Cape Town mentioned to me during a discussion about doub'e pathology, the association of hiatus hernia, sacculi of the colon and gallstones. Its prognostic importance in avoiding unwarranted treatment and the wide differential diagnosis from a host of pulmonic, cardiac and abdominal conditions, makes this triad of practical as well as academic interest."

Brombart, Goutkine and Laurent[2] mentioned 3 cases in 1950. Palmer[3] in 1951 reviewed the records of 31 patients with hiatus hernia at the Walter Reed Army Hospital. In each of these patients the investigation included the gallbladder, the colon and the upper part of the gastrointestinal tract. Among these he found 5 with Saint's triad. Wissmer,[4] in 1951, also reported 11 cases. Berardinelli[5] reported another case in 1952, and Delannoy[6] discussed the surgical management of 1 case in 1953.

Palmer,[7] in 1955, reported 24 cases of Saint's triad from the gastrointestinal clinic of Walter Reed Army Hospital. These cases were among those of 170 patients with hiatus hernia. Palmer pointed out that there may have been many more, for the cases were investigated as the clinical situation dictated. In 18 of the 24 reported cases the patients were treated surgically, with a total of 30 operations. In 16 of the 18 patients the first surgical effort was directed at the gallbladder. Only one was cured, and 9 were not helped at all. Nine underwent a second operation for repair of the hiatus hernia. This time 6 were cured or helped. Palmer considered it significant that disease of the gallbladder was first suspected, first looked for, first diagnosed and first treated, yet was only infrequently the cause of the patient's illness.

Of 25 patients with hiatus hernia admitted to the Second Surgical Division of Fordham Hospital from Jan. 1, 1953, through June 1, 1956, there were 2 with Saint's triad. There may have been more, for the patients were investigated only as the clinical situation dictated. Of the 23 remaining patients with hiatus hernia, 6 had diverticulosis as well, and in 4 others the gallbladder could not be visualized by cholecystographic studies.

REPORT OF CASES

CASE 1.—A. S., a 57-year-old white woman, was admitted to the hospital because of hematemesis. The past history revealed hematemesis and tarry stools one year earlier. The patient had an intolerance to fatty food. Physical examination on admission, Jan. 11, 1954, showed her to be obese. The abdomen was pendulous and soft, with no pal

From the second surgical division of Fordham Hospital.
*Resident in Surgery
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masses. The value for hemoglobin was 5.5 Gm.; the red blood cell count was 2,000,000 per cubic millimeter, and the urine was normal. The value for blood urea nitrogen was 13 mg., and that for blood sugar 100 mg., per hundred cubic centimeters. A gastrointestinal series taken on January 26 was reported as follows: "Hiatus hernia. No gastric lesion. Duodenal bulb small and contracted, but no ulcer niche or crater demonstrated. About 10 per cent gastric retention at six hours. Several biliary calculi noted." Esophagoscopic examination performed on February 5 revealed no pathologic condition. The patient was given multiple blood transfusions, and on February 15 the hiatus hernia was repaired. The operation was performed by a left thoracic approach; the left seventh rib was resected, the sac imbricated and the crura approximated. The patient did well and was discharged on March 1.

She was readmitted on March 11 for melena of one day's duration. The value for hemoglobin was 9.9 Gm. The blood chemical values were normal. A gastrointestinal series taken on March 12 was reported as follows: "No evidence of hiatus hernia, no gastric or duodenal lesion, with 10 per cent retention in five hours." The esophagram was normal. Bleeding apparently stopped, and the patient was discharged on April 3.

This patient was repeatedly admitted to the hospital at intervals of about three to four months, for severe melena. A typical admission was that of August 30, 1954. The value for hemoglobin was 6.1 Gm. and the red blood cell count 2,400,000 per cubic millimeter. The level of blood urea nitrogen was 12 mg. per hundred cubic centimeters. The prothrombin time, the platelet count and the clotting and bleeding times were normal. Hemolysis of red cells began at 0.48 per cent and was completed at 0.40 per cent. The value for total proteins was 5.6 mg., and the albumin-globulin ratio was 1:1. The bromsulfalein test showed 1 per cent retention at forty-five minutes. The esophagram was normal. A gastrointestinal series taken on September 2 was reported as follows: "No lesion in the stomach. There is a small diverticulum in the second portion of the duodenum." A cholecystogram revealed a large calculus of the gallbladder. Gastroscopic examination (September 13) revealed no abnormality. The patient was given multiple blood transfusions, with improvement. Sigmoidoscopic study on September 15 revealed no abnormality, and a barium enema on September 16 revealed diverticulosis of the transverse, descending and sigmoid portions of the colon. The last admission of this woman occurred on Jan. 26, 1956, again for melena. Complete examination showed no other pathologic condition than had previously been observed, and the patient was discharged to the outpatient department on February 8.

CASE 2.—S. D., a 40-year-old white woman, was admitted to the hospital on April 30, 1956, complaining of severe abdominal pain of two days' duration. This attack began with severe pain in the right upper quadrant of the abdomen, radiating to the back and accompanied by nausea and vomiting. The patient had had attacks of colic for the past two years. Physical examination showed marked tenderness in the right upper quadrant of the abdomen, with no rigidity. There were no palpable masses in the abdomen. The urine was normal. The value for hemoglobin was 12.7 Gm., and the white blood cell count was 7,400 per cubic millimeter, with a normal differential count. The value for blood urea nitrogen was 14 mg., and that for blood sugar 90 mg. per hundred cubic centimeters. The results of liver function tests were as follows: bromsulfalein, 3 per cent retention in 45 minutes; total protein, 6.4 mg. per hundred cubic centimeters. The albumin-globulin ratio was 1.1:1. The cholesterol-cholesterol ester ratio was 224:175. The electrocardiograph was normal. A gallbladder series taken on May 3 was reported as showing small nonopaque calculi. A gastrointestinal series taken on May 4 revealed a large hiatus hernia. A barium enema revealed diverticulosis of the sigmoid and descending portions of the colon. Cholecystectomy was performed on May 11 and a gallbladder containing multiple calculi was removed. The postoperative course was uneventful, and the patient was discharged on May 28. She was last examined on June 16 and reported that she felt well.

These cases are presented with the kind permission of Dr. A. B. Sullivan, director, Second Surgical Division, Fordham Hospital.

COMMENT

Coexisting diseases of the abdomen present a diagnostic and therapeutic problem. Among these Saint's triad (hiatus hernia, gallstones and diverticulosis) is important. Palmer[7] recorded an incidence of 14 per cent in 170 patients with hiatus hernia at

the Walter Reed Army Hospital It would appeai, therefore, that Saint's triad is common in patients with hiatus hernia Palmer concluded that if a patient with a hiatus hernia has either gallstones or diverticulosis, there is an excellent chance that the third disease is present as well

The relation between the component lesions of the triad and the clinical picture may be hard to evaluate, since the symptoms of the individual lesions may mimic each other It is important, however, to determine how much each lesion is contributing to the total picture of illness To do so may prevent unwarranted treatment

SUMMARY

Saint's triad (hiatus hernia, gallstones and diverticulosis) is described Awareness that Saint's triad is common in patients with hiatus hernia may help in avoidance of unwarranted treatment

The relation between the component conditions that make up the triad and its clinical picture may present some difficulty in evaluation, the symptoms of each having a tendency to simulate those of the others It is nevertheless important that the role each condition is playing in the total picture should be identified

Two cases are reported In the first case, repair of a hiatus hernia failed to cure the patient, in the second, cholecystectomy brought about a good result

RÉSUMÉ

La triade de Saint (hernie du hiatus, calculs biliaires et diverticulose) ets decrite La connaissance du fait que la triade de Saint est courante chez les malades porteurs d'une hernie du hiatus peut aider a eviter une therapeutique inadéquate

Deux cas sont rapportés Dans le premier la reparation de la hernie n'a pas gueri le malade, dans le second, la cholecystectomie a donne un bon resultat

RIASSUNTO

Viene descritta la triade di Saint ernia dello hiatus, colecistite calcolosa e diverticolosi La nozione che la triade di Saint e frequente nei portatori di ernia hiatale giova ad evitare una cura inadatta

Ne vengono riferiti tre casi nel primo l'intervento diretto sull'ernia dello hiatus non ebbe successo, nel secondo, invece, si ebbe un buon risultato con la colecistectomia

ZUSAMMENFASSUNG

Es wird die Saintsche Trias (Hiatushernie, Gallensteine und Divertikulose) beschrieben Wenn man daran denkt, dass Kranke mit einer Hiatushernie oft die Saintsche Trias aufweisen, kann man unzweckmassige Behandlung vermeiden

Es wird uber zwei Falle berichtet Im ersten brachte die Reparatur einer Hiatushernie keine Heilung, im zweiten fuhrte die Gallenblasenresektion zu gutem Erfolg

SUMARIO

A triade de Santo (hernia hiatal, pedras na vesicula e diverticulose) e descrita O conhecimento de que a triade de Santo é comum em pacientes com hernia hiatal, pode auxiliar a evitar tratamento desaconselhavel

Dois casos são relatados No primeiro caso, o reparo da hernia hiatal falhou em curar o paciente, no segundo, a colecistectomia deu bom resultado

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War may bring a reversion to the primitive problems of surgery, but is the work, therefore, less scientific or less valuable? It were truer to say that war brings a return to the foundations of surgery; and just as no nation can be great which has no pride in its history, so no art or science can remain healthy or progressive which does not from time to time review the foundations of its structure. The basis of surgery is the treatment of wounds and injuries, for even the most delicate operation of the super specialist, perfected by yearly improvements and daily repetition into a work of fine art, is nevertheless an injury, a wound which must heal. In treating the wounded, the war surgeon is learning the art of his profession, the capacity to assess surely, decide quickly and act confidently, the readiness to subject his own interests to those of the patient, the ability to work as a member of a team for the common good. In observing the reaction of the body to injury he is returning to the groundwork of all surgical science. And in studying these processes with careful precision, recording what he observes and not what he is told should or does happen, in applying to each method that he uses the same critical standards, he is conducting research in the highest sense. For research means inquiry, and inquiry into the limits of the known demands no less industry, no less discrimination, no less originality than inquiry into the unknown. When we pause to switch the torch of investigation, which has been turned solely into the darkness ahead, to light the path behind and the land of each side of us, we learn not only of the way we have come and the place where we stand; we learn more of where we are going and what is the best way to get there.

—Ogilvie

Congenital Absence of the Gallbladder in Man

Report of a New Case

N N IOVETZ-TERESCHENKO, F R C S (Eng), F R S M F I C S*

DACCA, EAST PAKISTAN

THE presence of a gallbladder is a typical characteristic of vertebrate animals (Gorham and Ivy[1a]) It is normally absent, nevertheless, in the adults of an impressive number of species, far more than the nine species of birds, seventeen of fish and twenty-six of mammals listed by Mentzer in 1929 [2] Occasionally it may also be abnormally absent in otherwise normal adults of species in which it is usually present

Scammon, in 1916,[3] presented a clear and classic description of the three different types of development of the biliary tract observed in vertebrates lacking a gallbladder in the adult, as represented by Petromyzon (the lamprey), Columba (the pigeon) and Cricotina (the rat)

In man, bile is secreted continuously and at the rate of 20 ml per kilogram of body weight per twenty-four hours (Gorham and Ivy, 1938[1b]) It is the function of the gallbladder to concentrate and store the bile and to release it when it is needed for digestion

Congenital absence of the gallbladder in man has always been considered rare (Aird, 1949[4]) The first recorded case was reported by Lemery Le Fils in 1701 [5] Accounts of many more cases have been published since Bower,[6] in 1928, collected 67 reported cases and added 1 more Dixon and Lichtman,[7] in 1945, listed 30 cases reported before 1900 and 50 after 1900, adding 10 additional cases to the list Latimer, Mendez and Hage,[8] in 1947, reported 3 new cases and accepted 71 of the cases previously recorded as genuine instances of congenital absence of the gallbladder as distinguished from atresia or atrophy, Kobacher,[9] in 1950, reported 2 cases in which the patients were sisters and suggested that the defect, if such it is may be hereditary and familial (The possibility had already been considered and mentioned by Lemery Le Fils in reporting his case)

A short but reasonably thorough search of the literature shows that from 1947 to 1955 no fewer than 29 new cases of this anomaly were reported· Santos Cuyngem and de Padua, 1948,[10] Penteado de Castro, 1948,[11] Timoney, 1948,[12] Villareal, 1948,[13] Zimmerman, 1948,[14] de Andrade and Pennad de Azevedo, 1949,[15] Atay and Karaca, 1949,[16] Hillemand, Rosentiel and Brule, 1949,[17] Lamprecht, 1949,[18] de Yeo and Castronuove, 1950,[19] Labbe and Pettigrew, 1950,[20] Kobacher, 1950,[9] Schmorell, 1950,[21] Sharpe, 1950,[22] Pasmal, 1951,[23] Rains, 1951,[24] Belloso, 1952,[25] Caylor, 1952,[26] Kanof, Donovan and Berner, 1953,[27] Lima, 1953,[28] Malmstrom, 1953,[29] Pablos, 1953,[30] Echegaray, 1954,[31] Gawinska-Ostrowska and Alichniewicz, 1954,[32] Goldenberg, 1954,[33] Nevill, 1954,[34], and Polivy and Sachs, 1954[35] No cases reported for 1955 were discovered, although further reports would probably be found in a really exhaustive search

The following case is reported as an additional instance of congenital absence of the gallbladder in man Since a few liver function tests were performed on two separate occasions, it is [illegible] worth to record the laborat-

*Associate Professor of Surgery Medical College and Visiting Surgeon Medical College Hospital Dacca
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REPORT OF CASE

A 49-year-old East Indian, male, was admitted to the hospital on Oct. 11, 1953, complaining of sudden severe pain in the upper part of the abdomen. The attack had begun on the previous night, i.e., about twenty-four hours earlier, and the pain was growing steadily worse. He had had several similar attacks in the past year or two, but none as severe as the one that brought him to the hospital.

The patient looked decidedly ill. The upper part of the abdomen was rigid, with tenderness in the epigastrium and under the right costal margin. There was no tenderness on rectal examination.

A tentative diagnosis of perforated duodenal ulcer was made, and the patient was prepared for operation. Through a right upper rectus-splitting incision, it was observed that the peritoneal cavity contained no free fluid or air. The stomach and duodenum were normal. The vermiform appendix adhered from its tip to the greater omentum and was acutely kinked, but not inflamed. Since the gallbladder was neither palpable nor visible, the incision was deliberately enlarged until the undersurface of the liver and the free margin of the lesser omentum were clearly visible. No trace of a gallbladder could be found. The hepatic and bile ducts appeared normal. The incision was closed in layers in the usual manner.

Test	*Result*
Hemoglobin	74%
Group	B
Laughlen	Negative
Urine	Bile and Bilirubin present; Urobilinogen absent
Van den Bergh	Positive
Takata-Ara	Positive +++
Hanger's cephalin cholesterol	Positive ++
Thymol turbidity	7 units
Icterus index	10
Serum alkaline phosphatase	8.76 modified Bodansky units
Serum bilirubin	1.75 mgms./100 cc.
Total serum proteins	6.25%
Serum albumen	2.8%
Serum globulin	3.45%
Albumen-globulin ratio	0.8/1
Bromsulfthalein excretion	
After 5 minutes	55% dye retention
After 30 minutes	Dye retention nil

On October 14 diarrhea and jaundice developed. The tests, shown in the table below, were performed between that date and October 22.

On October 19 the jaundice began to subside and there was no more diarrhea.

On October 26 a cholecystogram was taken and revealed no shadow that could possibly have been an intrahepatic gallbladder.

On November 3 the patient was discharged, as the incision was soundly healed and there was no jaundice. He was asked to return in one month.

When he was seen on December 2 he felt and looked perfectly healthy. Clinical examination revealed no abnormal physical signs. There was no jaundice.

The Takata-Ara reaction was still 3 plus positive and the thymol turbidity reading was 8 units. Unfortunately he refused to undergo any further tests and has not returned for further follow-up as requested. This suggests that he continues to feel well.

SUMMARY

A case of congenital absence of the gallbladder in man, discovered during an emergency operation, is reported in some detail, after a brief review of the literature on the subject.

CONCLUSIONS

Since well over 100 cases of congenital absence of the gallbladder in man have been collected in a far from exhaustive search of medical literature, this condition does not appear to be excessively rare, as was hitherto believed.

For comparison, Robinson (1952)[36] was able to collect only 69 cases of congenital absence of the vermiform appendix.

Talmadge (1938)[37] estimated, on the basis of 18,350 postmortem examinations, that the incidence of true congenital absence of the gallbladder in man is approximately 0.065 per cent.

One could almost speculate as to whether *homo sapiens* as a species is beginning to lose his gallbladder or, on the contrary, has almost acquired it.

The condition is apparently less rare than it has hitherto been considered

RESUMÉ

Un cas d'agenesie congenitale de la vesicule biliaire chez un homme, découvert durant une operation a chaud, est decrit après une brève revue de la litterature

Cet etat est considere comme plus fréquent qu'on ne l'a cru jusqu'a ce jour

RESUMEN

Se comunica con cierto detalle un caso de agenesia congenita de la vesicula biliar en el hombre Fue descubierta durante una operacion de urgencia Se menciona literature sobre el tema

Dicha anomalia no es tan rara como se creia

RIASSUNTO

Viene riferito in dettaglio un caso di assenza congenita della colecisti in un uomo sottoposto ad un intervento d'urgenza, e viene passata rapidamente in rassegna la letteratura sull'argomento

L'affezione e meno rara di quanto si creda

ZUSAMMENFASSUNG

Nach einem kurzen Ueberblick uber die einschlagige Literatur wird ziemlich ausfuhrlich uber einen Fall von kongenitalem Fehlen der Gallenblase am Menschen berichtet Die Abwesenheit des Organs wurde wahrend einer Notoperation entdeckt

Es wird angenommen, dass die Anomalie nicht so selten ist wie man bisher geglaubt hat

SUMARIO

Um caso de ausência congênita da vesícula biliar em homem, descoberta durante te uma operação de emergência, é relatado com certes detalhes, depois de ligeira revisão da literatura

A condição e considerada menos rara do que se acreditou ate agora

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William Stewart Halsted is an unusual example of the egomaniac temperament who achieved supreme success in an art which usually demands that its exponents shall be openhearted and forgetful of themselves . . . His large, old house in Baltimore was full of antique furniture and rugs beautifully arranged, and he would permit no form of heating except wood fires made up of white oak logs of specified dimensions. When guests came for dinner, they were treated to the ritual of his coffee-making which consisted of the picking out with surgical forceps the most likely beans, and culminating in a brew which his friends said kept them awake for days and nights following. His need for private ceremonial became so oppressive that dinner parties were finally abandoned, and the doctor and his wife lived each a self-centered life in their large mansion, she on the third floor, he on the second, and they rarely visited friends. Whenever they could, they went to a country place among the mountains of North Carolina where Mrs. Halsted loved to ride and grow flowers under the tall trees, and there her husband could relax too as was impossible for him in the city.

Dr. Halsted was most particular about his silk hat, his suits tailored in London. His boots had to be made only out of leather from a particular portion of the animal's side, and Halsted would inspect every new pair with his usual myopic concentration, and very often the boots would be sent back to the maker because they failed to reach his requirements. No washerwoman in Baltimore was good enough to launder his shirts, and he sent them regularly to Paris where he felt artistic satisfaction could be guaranteed though the Parisian *blanchisseuses* probably washed those precious shirts in the waters of the Seine.

—*Williams*

Congenital Renal Aplasia with Calcified Cystic Degeneration

Report of Two Cases and Review of the Literature

BENJAMIN S. ABESHOUSE, M.D., F.A.C.S., F.I.C.S., D.A.B.*

BALTIMORE, MARYLAND

CONGENITAL anomalies of the kidney, particularly renal agenesis, aplasia and hypoplasia, have always attracted the attention of urologists because of the perplexing problems involved in their diagnosis and treatment. The recent refinements in urographic diagnostic procedures and the improvements in operative technics have resulted in more frequent identification of these anomalies.

The purpose of this paper is to present a brief discussion of the clinical and pathologic features of congenital renal aplasia as distinguished from renal agenesis and hypoplasia and to report 2 unusual cases of calcified cystic degeneration of the vestigial remnant associated with the aforementioned anomaly.

Definition.—Considerable confusion and controversy prevail in the literature with regard to the exact nature of the congenital anomalies of renal structure as indicated by the wide variety of terms used to describe the same or different anomalies. Since each of three principal anomalies of the structure, i.e., agenesis, aplasia and hypoplasia, possess special clinical and pathologic significance, a precise knowledge of the different conditions is essential to a complete understanding of the subject. The distinguishing clinical and pathologic features of these three anomalies are listed in the accompanying table.

Renal Agenesis.—This anomaly is characterized by complete absence of nephrogenic tissue on one side and is due to failure or faulty development of the nephrogenic elements of the Wolffian duct (ureteric bud) and the primitive analage of the permanent kidney (metanephric blastema). Consequently the kidney, the ureter and the corresponding half of the trigone of the bladder are absent. The suprarenal gland on the agenetic side is also absent. The mullerian duct on the agenetic side may be absent or may undergo faulty development resulting in anomalies of the female genital organs. On the contralateral side, the congenital solitary kidney shows a pronounced increase in size and functional capacity due to embryonic compensatory hypertrophy. The solitary kidney is usually in the normal position but occasionally occupies an ectopic or crossed position. The diagnosis is made by cystoscopic, retrograde pyelographic and/or excretory urographic investigation.

Congenital Hypoplasia.—This anomaly is characterized by a diminutive reniform organ two to six times smaller than the opposite congenital hypertrophied mate. It is attributed to subnormal or defective growth of the permanent metanephrogenic

*Director, Department of Urology, Sinai Hospital, Baltimore.

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elements (i.e., ureteral bud and metanephric blastema) and/or defective development of the permanent blood supply. The outstanding architectural features are (1) there is a decided reduction in the amount of cortical tissue; (2) there is faulty development, distortion or absence of the medullary tissue; (3) the renal pelvis is reduced in size, being either long or narrow or a simple bulbous (hydronephrotic) dilatation, and (4) the calyces are notably smaller and frequently abnormally rotated, or they may be rudimentary or absent. Histologically the glomeruli and tubules in the cortical zone appear normal but reduced in total number, whereas the tubular elements in the medullary zone are incompletely developed or rudimentary. The ureter is smaller in caliber but patent throughout. The adrenal gland is present and of normal size. The vascular pedicle is situated normally but is reduced in size and often reveals sclerotic changes in the walls of the vascular components, which may be responsible for the hypertension occasionally observed in children and adolescents with this anomaly. The diagnosis is readily established by excretory or retrograde urography and differential functional studies of each kidney.

The most striking feature of renal hypoplasia is the marked decrease, both quantitative and qualitative, in the excretion of dyes (indigo carmine and phenolsulphonphthalein). When the opposite hypertrophied kidney is removed for any reason whatsoever, the hypoplastic kidney is incapable of carrying the entire excretory burden because of its physiologic deficiency and its inability to undergo compensatory hypertrophy. In the latter circumstance the clinical picture is that of gradual and progressive renal insufficiency with a fatal termination.

Renal Aplasia.—This anomaly is characterized by a total lack of definite anatomic form and physiologic function. It is the result of an early embryonic failure or cessation of development of the analage of the permanent kidney and ureter. Some writers, including myself,[1] have considered the aplastic kidney an extreme variety of the hypoplastic kidney. The following anatomic features serve to differentiate the aplastic from the hypoplastic type: (1) the aplastic kidney is smaller, more rudimentary, and devoid of any definite shape; (2) it is composed of a small irregular mass of fibrolipomatous tissue surrounded by perirenal fat and situated in the renal fossa or its vicinity; (3) histologic study may reveal a scant amount of embryonic glomeruli or tubules surrounded by dense fibrous or fibrolipomatous tissue with a varying amount of sclerotic, hyaline or calcific change in the tubular elements and stroma or total absence of nephrogenic elements; (4) the renal pelvis and calyces are absent; (5) the ureter which is usually a poorly devoloped or cordlike structure in the upper two-thirds and incompletely developed, atrophied or dilated in the lower third, and (6) the vascular pedicle is usually absent or represented by a thin sclerotic artery derived from the suprarenal artery. There is no evidence of excretory function in the aplastic kidney as determined by ureteral catheterization or excretory urographic study.

The aforementioned anatomicopathologic and physiologic changes are observed in the aplastic kidney in infants and children. In adolescents and adults the aplastic kidney may exhibit marked cystic degeneration. The cysts vary in number from one to twenty-five and in size from that of a pinhead to that of a hen's egg. They are scattered throughout the vestigial remnant, producing an irregular lobulated, nontender, movable mass palpable in the upper abdominal quadrant or in the loin. As a rule the mass is smaller than the normal kidney, but occasionally it may be one or two times larger. Not infre-

quently the scattered cysts present the appearance of a bunch of grapes. The individual cysts are held together by loosely arranged strands of connective tissue. Their fluid content is yellow or brown, and they are non-urinous; frequently they contain mucous or colloid material. Hyalinization, calcification, cartilage formation and ossification have been reported as appearing in the walls of the cysts or in fibrous tissue between them. The absence of a pelvocalyceal system, the loss of cortical and medullary architecture and failure to demonstrate intercommunication between the cysts or a communication with a portion of the pelvocalyceal system or ureter indicate that the underlying process is a developmental defect and not a hydronephrotic process.

In the past, cystic degeneration has not been generally associated with renal aplasia by the urologist or the pathologist. Consequently the condition has been reported in the literature as unilateral multicystic kidney[2] or retroperitoneal cyst of metanephric origin[3] or has been incorrectly diagnosed as congenital cystic hypoplasia,[4] unilateral polycystic disease,[5] unilateral multilocular cyst[6] and multiple simple cysts.[7]

The term "unilateral multicystic kidney" was first employed by Schwartz[2a] in 1936 to describe an irregular lobulated multicystic mass removed from a seven-months-old infant. In 1955 Spence [2b] collected 15 cases and added 4 of his own. Similar cases have also been reported by Rosenow,[8] Galken,[9] Ultzman,[10] Burkland[11] (Case 2), and Buchert and Moore.[2d] The anatomic, pathologic and histologic features in these cases are exactly similar to those encountered in cases of cystic degeneration of a congenital aplastic kidney.

On the other hand, congenital polycystic disease should be readily distinguished from cystic degeneration of the aplastic kidney by its many unique features: (1) bilaterality, (2) inheritable tendency, (3) preservation of reniform shape, (4) presence of pelvis and calyces, which are distorted by the cysts, (5) intact ureter, (6) presence of well developed vascular pedicle, (7) normal, compressed or atrophied glomeruli or tubules interspersed between the cysts, (8) a honeycomb or spongelike appearance (of the infantile type) due to myriads of small cysts more or less uniform in size, (9) countless number of cysts (in the adult type) varying in size from that of a pea to that of a hen's egg, and (10) the characteristic pyelographic signs, i.e., shortening, obliteration, compression or elongation of the calyces with peculiar oval or crescent rounded outline and compression, distortion, and displacement of the renal pelvis.

The multilocular cystic kidney may be readily distinguished from cystic aplasia by the following points: 1. The cystic process is confined to one portion of an otherwise normal kidney. 2. The large cysts are subdivided or partitioned, with resulting formation of a lobular cyst. 3. Pyelographically the cystic process produces a localized compression of some portion of the pelvocalyceal system. Multiple serous cysts likewise occur in an otherwise normally developed kidney and produce similar pyelographic changes in the pelvocalyceal system.

Etiologic Factors.—Readers interested in the embryologic factors involved in the development of renal aplasia, agenesis and hypoplasia are referred to the excellent contributions of Gutierrez,[12] Nation[13] and Mallard.[14] Further discussion of this phase of the subject will be omitted except to state that there is no evidence to support the contention of the German writers that these congenital anomalies are due to defective development of the pronephros, the most primitive kidney of early embryonic life.

Pathogenesis.—There is no unanimity

of opinion with regard to the pathogenesis of the cyst formation associated with renal aplasia. The most logical explanation is "failure of union between the nephrogenic elements of the ureteral bud and metanephric blastema" (Hildebrandt[15]). The development of true unilateral or bilateral polycystic disease can be explained by the same theory, but most authors attribute the cyst formation to "persistence of the vestigial structure" (Kampmeier[16]). It is generally agreed that the formation of a multilocular cyst and multiple serous cysts is due to the "acquired combination of localized renal tubular blockage and vascular obstruction (ischemia)" as suggested by Hepler.[17]

Pathologic Picture.—The aplastic kidney of an infant or a child is an irregular formless mass of fibrolipomatous tissue, surrounded by perirenal fat and situated in the renal fossa somewhat closer to the midline. This vestigial remnant is firm or stony hard, weighs from 2 to 12 Gm. and is 6 to 12 cm. long and 2 to 3 cm. wide. Usually, when the mass is divested of the perirenal fat, no true renal parenchyma is detected, but in an occasional case a very small nubbin of parenchyma has been observed.

On cross section, the cut surface reveals a diffuse fibrous mass with a varying amount of fatty infiltration. No recognizable parenchyma or pelvocalyceal system is detected. In most cases the portion of ureter attached to the vestigial mass is a small, thin cordlike structure about 3 to 10 cm. long. The middle third of the ureter may be absent or atresic, and the lower third appears as a rudimentary tubular structure. In an occasional instance the entire ureter may be present as a small, thin patent tube.

The microscopic observations are pathognomonic. There may be a total absence of cortical and medullary element or a scant number of rudimentary tubules and glomeruli. In the latter type the tubules are small, atrophic structures lined with simple columnar or low cuboidal epithelium. The rare glomeruli show advanced sclerotic or hyaline changes. These rudimentary tubules and glomeruli are devoid of physiologic function and are surrounded by a diffuse, dense fibrous stroma containing scattered, small, contracted blood vessels and occasional foci of hyaline and/or calcium deposits. Round cell infiltration and scarring are not infrequently noted and are indicative of chronic infection. In a few cases, considerable dilatation of the tubular elements has been observed.

The aplastic kidney with cystic degeneration is usually encountered in the adult. The kidney mass has an irregular lobulated appearance, resembling a bunch of odd-sized grapes. The cysts are separate and discrete, bound together by thick strands or masses of fibrous tissue. The walls of the cysts, which are lined with low cuboidal or flat epithelium, vary in thickness from 1 to 3 mm. and are composed of fibrous tissue. Localized and diffuse degenerative (hyaline and calcific) and metaplastic (cartilaginous and osseous) changes have been described as occurring in the walls of the cysts in elderly patients.

I have collected 16 cases of extensive calcification of cysts in aplastic kidneys[18] and in this article report 2 personal cases. Ossification in the walls of renal cysts has been reported in 4 cases,[19] including my own Case 1. Scattered deposits of calcium have been observed in histologic sections of the cyst wall (though not discernible in the roentgenograms) in 4 cases[20] and cartilage formation in the cyst walls in 2.[21] The pathogenesis of these degenerative and metaplastic changes are of special interest from a clinical and pathologic standpoint and warrant further discussion.

Calcification of the renal substance is

an infrequent, though not uncommon, pathologic observation and has been the subject of much clinical and experimental study. Renal calcification occurs in two main forms, metastatic and dystrophic. The metastatic variety is associated with a wide variety of diseases that are accompanied by hypercalcemia but not necessarily by a renal lesion. The dystrophic or nonmetastatic type is the more common variety and is associated with chronic destructive, degenerative or vascular disease of the kidney. The localized calcium deposits in the cyst walls or fibrous stroma and the diffuse calcification of the cyst walls in the adult type of aplastic kidney belong in the latter category. The important factor is the presence of local retrogressive changes, i.e., fatty infiltration, fibrosis, ischemia, necrosis, hyalinization, etc., rather than variations in the physiologic levels of the calcium salts in the blood or the tissue fluids. The degree of calcification is influenced to some extent by the degree of vascularity, the enzymatic changes in the tissue and the availability and concentration of calcium salts.

The formation of bone or cartilage in the kidney is rare and indicates a metaplastic change resulting from the development of osteogenetic properties in undifferentiated connective tissue cells (fibroblasts). The experimental studies of Blessig,[22] Saccerdotti and Fratten,[23] Ceccarelli,[24] Strauss,[25] Neuhoff,[26] Phemister,[27] Huggins[28] and others have established the fact that certain physiologic conditions are essential to the formation of bone in the kidney.

Incidence.—Unilateral renal aplasia is a relatively common lesion and is observed in persons of all ages. Guterriez[12] in 1935 reviewed a combined series of 92,690 autopsies and reported the relative frequency of aplasia as 1 in 400, that of hypoplasia as 1 in 600 and that of agenesis as 1 in 1,600. Campbell[30] in 1954 reported the incidence of aplasia to be somewhat lower, i.e., 94 cases in 51,880 autopsies (1:552). Smith and Orkin[31] encountered only 7 cases of aplasia among 471 congenital renal anomalies observed in 18,460 consecutive hospital admissions (1 in 3,845). I have encountered only 4 cases of congenital renal aplasia among 512 congenital renal anomalies (5,600 urologic admissions and 110,000 general hospital admissions to Sinai Hospital during the ten-year period from 1945 to 1955).

The incidence of this lesion is probably greater than the figures indicate. Undoubtedly many more cases will be added when an accurate definition and classification of renal structural anomalies has been universally established and the anomaly is correctly identified more frequently at operation or by pathologic study.

The anomaly has no predilection for either sex or side. Although the aplastic kidneys devoid of cystic degeneration are observed more commonly in infants and children, multiple cystic changes have been reported as occurring in this same age group. Secondary degenerative (calcific) and metaplastic (cartilaginous or osseous) changes are more frequently observed in the adult.

Clinical Picture. — No characteristic symptom complex is associated with unilateral renal aplasia. In the majority of cases there are no symptoms referable to the genitourinary tract, and the diagnosis is established during a routine urographic study or at autopsy. In a few cases the aplastic kidney may be accompanied by one or more of the following symptoms: dull pain, fever, malaise, urinary infection or hypertension, which may occur at any age. In an occasional case the pain may be so distressing and severe as to require nephrectomy for relief. The pathogenesis of the pain cannot always be clearly established, but it has been attributed to the pressure of the fibrolipomatous mass on

Differentiation of Renal Hypoplasia, Aplasia and Agenesis from an Anatomic, Clinical, Pathologic and Radiographic Standpoint

	Hypoplasia	*Aplasia*	*Agenesis*
Terminology	Fetal, infantile or rudimentary kidney; congenital, primary or relative atrophy	Unilateral multicystic kidney; Congenital multiple cystic kidney; Congenital aplasia; Renal aplasia	Total agenesis; Congenital absence of kidney; Congenital solitary kidney; Unilateral solitary kidney
Size	Small (1/3 to 1/6 size of normal kidney)	Diminutive 2-3 cm.	Absent
Shape	Reniform, bean-shaped	Fibrolipomatous mass, fibrous, irregular, diminutive	Absent
Renal cortex	Normal	Scant amount of embryonic glomeruli or total absence	Absent
Renal Medullary	Normal or absent	Scant amount of embryonic tubules or total absence	Absent
Cystic degeneration	None	One or more cysts, hyalinization, calcification of walls	Absent
Renal pelvis	Rudimentary or hydronephrotic	Absent	Absent
Renal calyces	Bizarre size and shape, or absent	Absent	Absent
Renal pedicle	Normal position; small	No true pedicle; occasional aberrant artery	Absent
Renal ureter	Patent	Upper portion absent; lower portion rudimentary or incompletely developed, not patent	Absent
Ureterovesical orifice	Normal position	Normal	Absent on affected side
Interureteric ridge	Normal	Normal	Absent on affected side
Trigone	Normal	Normal	Absent on affected side or distorted
Opposite kidney	Hypertrophied	Hypertrophied	Hypertrophied; 10% are ectopic or malrotated; and of bizarre shape
Urine secretion	Normal or diminished	None	None
Renal function	Diminished	None	None
Phthalein	Normal appearance time; total excretion diminished	None	None
Urea excretion	Total excretion diminished	None	None
Plain plate	Small outline of kidney	No outline of kidney	No outline
Excretory urogram	Diminutive outline of pelvis and calyces	No excretion of dye	No excretion
Retrograde pyelogram	Diminutive outline of pelvis and calyces	Dye may fill lower end of ureter and pass back	Negative
Urographic diagnosis	Positive	Presumptive	Presumptive
Associated anomalies	Uncommon	Uncommon	Common—70% female genital tract; 20% male genital tract
Adrenal	Present	Present	Absent on agenetic side in 75%

the nerve endings or on the ureter, or to the pressure and tension of the accumulated fluids within the cyst or its pressure on adjacent tissue. The pain is not infrequently accompanied by nausea, vomiting, abdominal distention and other gastrointestinal symptoms due to displacement or pressure on the bowel by the irregular, lobulated cystic mass. Fever and malaise may be associated with the infection in the rudimentary tissue or within the cystic cavities. This may be independent of or associated with an infection in the lower part of the urinary tract, perhaps originating in the aplastic kidney and extending downward to the bladder through a patent ureter or during a transitory period when the ureter communicates with the pelvis and bladder. Hypertension has been noted by Nation[13] in 16 patients with aplasia.

Physical examination usually gives entirely negative results in the presence of a small aplastic kidney. The larger cystic type of aplastic kidney may be palpable as an irregular, lobular, nontender, movable mass in the renal area on the affected side. In many cases the contralateral hypertrophied kidney may also be palpated.

Cystoscopic study is of great value in diagnosis of the different renal structural anomalies. If agenesis is present, the ureteral orifice and the corresponding half of the trigone on the affected side are absent. In cases of aplasia and hypoplasia, both ureteral orifices usually appear to be normal in size, shape and position, and the trigone is normally developed. In an occasional case of aplasia, the ureteral orifice on the affected side is poorly developed and appears as a dimple. In most cases of aplasia a catheter can be passed up the ureter on the affected side for a varying distance (2 to 12 cm.), but no urine is obtained. Several cases of aplasia accompanied by infection have been reported in which urine was passed down the contracted ureter at irregular intervals, despite the fact that the catheter became obstructed a short distance above the ureteral orifice. In cases of hypoplasia, a voiding cystogram not infrequently reveals a dilated ureter and an atrophic kidney with a dilated pelvis.

Excretion tests with indigo carmine and phenolsulphonphthalein have considerable value in differentiating these anomalies. In the presence of aplasia or agenesis, no dye is excreted on the affected side. The hypoplastic kidney usually excretes the phenolsulphonphthalein promptly (within five to seven minutes), but a fifteen or thirty minute collection discloses a marked reduction in the amount of dye excreted (1 to 3 per cent), which is insufficient to sustain life in the event that the opposite kidney is removed. The urologist should never rely solely on the time of appearance of the excreted dye as a true indication of renal function in any congenital anomalous kidney that may be seriously impaired by inherent faulty development or by infection and obstruction.

Roentgenographic study is an important diagnostic aid. With agenesis or aplasia, there is no kidney shadow discernible in the plain (K.U.B.) roentgenogram. With hypoplasia, a small reniform shadow may be detected in contrast to the enlarged shadow of the contralateral hypertrophied mate. When cystic degeneration is a conspicuous feature of an aplastic kidney, the faint outline of an irregular lobulated mass may be detected. When calcification or ossification of the cyst walls is present in an aplastic kidney, calcified ring shadows, varying in size from that of a pea to that of a golf ball, may be seen in the renal fossa, closer to the midline than the normal kidney.

Excretory urographic study usually reveals prompt excretion of the opaque medium into a small dilated pelvis, with or

without rudimentary calyces in the case of a hypoplastic kidney. No dye appears in the renal area in cases of aplasia or agenesis.

Retrograde pyelographic study is the most useful means of differentiating between aplasia and hypoplasia. In the former, the ureter usually terminates blindly or is completely obstructed in its terminal portion at a level of 2 to 12 cm. When dye is injected, it fills the lower portion of the ureter and is regurgitated into the bladder. In the latter condition, the ureteral catheter is readily passed up into the pelvis and the injection of an opaque medium reveals a small dilated pelvis, saccular or cone-shaped, with absent, rudimentary or bizarrely shaped calyces. The small pelvis is surrounded by a thinned-out, reduced amount of renal parenchyma. The ureter of a hypoplastic kidney is smaller in size and caliber than the normal ureter and appears as a thin tubular structure extending from the bladder to the pelvis or calyx in a more or less straight line.

Other roentgenographic procedures, including presacral injection of air and aortographic investigation, have also been employed. The injection of air adds little useful information, but aortographic study may supply valuable information with regard to the size, location and origin of the vascular supply of the kidney, particularly in cases of aplasia and hypoplasia accompanied by hypertension.

It should be emphasized that not infrequently it may be difficult or impossible to differentiate clinically between primary aplasia or hypoplasia and secondary (acquired) atrophy of the kidney when an infection, obstruction or vascular disease is superimposed upon the anomalous kidney. In such cases the final diagnosis must depend upon a careful gross and microscopic examination of the removed specimen.

Differential Diagnosis.—Cystic degeneration of an aplastic kidney has been incorrectly diagnosed as, and must be differentiated from, the following conditions: Wilms' tumor; closed hydronephrosis due to obstruction at the ureteropelvic juncture; retroperitoneal tumor or cyst of nonrenal origin; mesenteric cyst; calcified renal tuberculosis; calcified cysts or hematomas of the kidney of traumatic origin, and cystadenoma of the kidney. A careful history and a complete urologic study will enable the urologist to establish an accurate preoperative diagnosis of most of the aforementioned diseases.

Treatment.—No treatment is indicated for the asymptomatic patient with either of these renal anomalies. When pain, infection or hypertension is present, removal of the kidney and the adjacent ureter affords complete relief. Before any operation is performed, it is imperative that the urologist determine the presence of a contralateral kidney capable of carrying the entire secretory burden.

In most cases of aplasia and hypoplasia, the kidney and adjacent ureter may be removed with relative ease through the usual lumbar incision. Some writers maintain, however, that the transperitoneal approach is preferable because it permits accurate determination and control of the vascular supply, avoids injury to the adjacent peritoneum and abdominal viscera and permits abdominal palpation or exploration of the opposite kidney.

REPORT OF CASES

CASE 1.—M. V. S., a white housewife aged 40, was admitted to the Surgical Service at Sinai Hospital on March 14, 1955, with a complaint of swelling of the mouth of one week's duration. She had had recurrent abscesses of the teeth for the past three years and was admitted primarily for the extraction of the remaining teeth. This was performed without incident. She also complained of vague recurrent dull pain in the right upper abdominal quadrant, unaccompanied by any serious gastrointestinal symptoms.

Physical examination gave negative results except for a palpable irregular nontender mass in the right loin. The hematocrit reading, blood cell counts, blood pressure and blood sugar and urea levels were normal. The serologic test for syphilis gave a positive result. The urinary sediment showed many pus cells and an occasional red blood cell, and culture of the urine revealed Bacillus proteus, Bacillus coli and Streptococcus fecalis.

A gastrointestinal series, gallbladder visualization tests and thoracic films revealed no abnormality. A plain film of the abdomen revealed a cluster of three calcified shadows in the right upper quadrant. The largest and most superior shadow was ovoid, measuring 7 cm. in length and 3 cm. in width. Two smaller shadows, round, and about 3 cm in diameter, were situated below the ovoid shadow (Fig. 1). Excretory urographic study revealed a normal kidney, pelvis, calyces and ureter on the left side but no secretion of dye in the right kidney area.

The patient was transferred to the urologic service on March 29, at which time cystoscopic and retrograde pyelographic studies were performed. The bladder walls were normal and both the ureteral orifices and the trigone appeared so. A No. 5 F catheter was passed up into the left renal pelvis with ease, but a No. 5 F Foley bulb catheter met an impassable obstruction 3 cm. up in the right ureter. Retrograde pyelographic study revealed a normal left kidney pelvis, calyces and ureter. On the right side dye was injected under pressure and appeared to become extravasated around the tip of the catheter at the level of the right ischial spine. A tentative diagnosis was made of (1) congenital nonfunctioning kidney (right) of the aplastic type with atresia of the ureter and (2) calcified cystic degeneration of right aplastic kidney.

Fig. 1 (Case 1).—Eight-minute film (excretory urogram) showing normal left kidney pelvis and calyces. No dye was excreted by the right kidney. Three calcified cystic shadows are seen in the right kidney area as indicated by arrows.

Fig. 2.—Section showing groups of vestigial tubular structures lined in part by pseudostratified tall cuboidal epithelium.

On April 5, total excision of the retroperitoneal calcified cystic mass was carried out through a typical curved lumbar incision. At operation, a small renal vein and no renal artery and no ureter were found. The convalescence was uneventful and patient was discharged on April 13, 1955.

Pathologic Report (Dr. Tobias Weinberg).—The gross specimen consisted of a congenital aplastic kidney containing three calcified cysts, apparently the result of arrested development in the metanephric stage (Fig. 2). The kidney mass measured 8 by 5 5 by 4 cm. The largest cyst measured 6 by 4 by 3 cm., and the other cysts varied from 0.3 to 1.8 cm. in diameter. The cyst contents were semiliquid and contained many cholesterol crystals. The cysts were separated by a network of fibrolipomatous tissue. A cordlike rudimentary ureter was attached to this mass for a distance of 3 cm.

Microscopic sections through the cyst wall

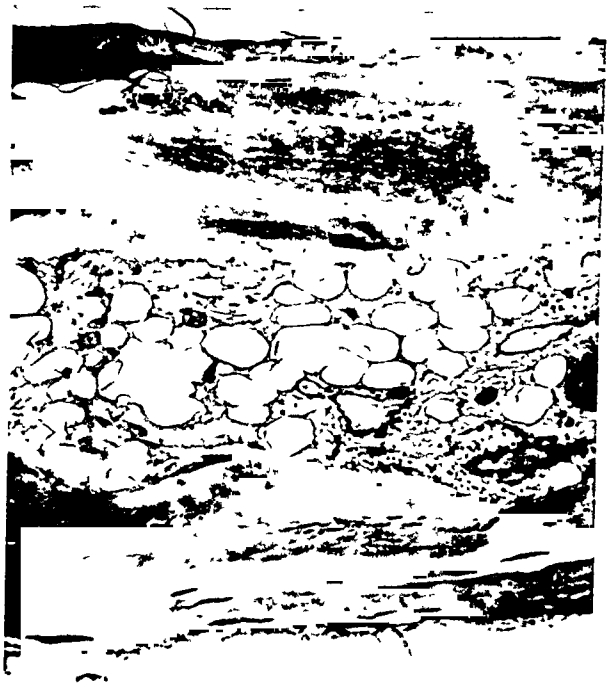

Fig. 3.—Section through cyst wall, showing a broad band of osseous tissue covered on both the inner and the outer aspect by compact, somewhat acellular connective tissue.

showed a varied appearance. In some areas there were aggregates of vestigial tubular structures lined by either single layer or by pseudostratified tall cuboidal epithelium (Fig. 2). There were also scattered small cysts. All the cysts were encased in a dense collagenous fibrous tissue. There were foci of calcium deposition as well as of osseous tissue formation (Fig. 3).

CASE 2.—J. S., an unmarried white man, aged 78, a retired clerk, was admitted to the urologic service of Sinai Hospital at 6 p.m. on Sept. 13, 1955, because of acute retention of urine for thirty hours. Symptoms of prostatism had been present for the past five years. Examination disclosed a distended bladder and benign hypertrophy of the prostate (Grade III). Catheterization was attempted but was unsuccessful, and an emergency suprapubic cystotomy was performed. Urethrographic studies were made three days later and disclosed an obstruction in the membranous portion of the urethra. Filiforms and a No. 16 follower were passed. On September 19 cystoscopic and cystographic studies were performed and revealed trilobular hypertrophy, with numerous cellules and trabeculations. The right ureteral orifice was normal in size and position, but the left ureteral orifice did not admit a catheter. A plain film of the abdomen showed a calcified oval mass measuring 3 by 4 cm. in the left kidney area, with several smaller calcified ringshaped masses above it (Fig. 4). The bones of the pelvis showed considerable sclerosis due to Paget's disease. Excretory urographic studies revealed an essentially normal right renal pelvis and calyces from a functional and architectural standpoint. No dye appeared in the left kidney area in thirty minutes. On October 5, translumbar aortographic study revealed a normal vascular pattern in the right kidney and complete absence of the left renal vascular pattern. On the following day presacral air injection showed no gas in the left renal area.

On October 11 a perineal prostatectomy was performed. The perineal wound was slow in healing, owing to scar tissue at the vesical neck, which was resected transurethrally on November 15. The patient was discharged on November 21, with the wound entirely healed and with perfect control of urine.

The patient refused to permit a renal exploratory operation to determine the exact nature of the calcified cystic mass in the left renal area. Consequently, the diagnosis of calcified cystic degeneration in an aplastic kidney in this case must be regarded as presumptive, since it is based on cystoscopic, urographic and aortographic data and is not supported by pathologic and histologic studies of the specimen.

Prognosis.—Since aplasia, with or with-

Fig. 4.—Plain film showing a large calcified shadow in the left kidney area and several smaller calcified cystic areas (indicated by arrows) situated above the large cyst.

out cystic degeneration, is a unilateral condition, removal of the vestigial mass offers an excellent lasting prognosis

CONCLUSIONS

A critical analysis of the literature on congenital renal aplasia, with and without cystic degeneration, and of the knowledge gained from a detailed study of 2 cases of *calcified cystic degeneration of a congenitally* aplastic kidney warrants the following conclusions

1 There is definite need for an exact definition of the three important congenital anomalies of renal structure, i e, agenesis, hypoplasia and aplasia, to enable the urologist and pathologist to diagnose and classify the cases properly

2 The distinguishing clinical and pathologic features of renal agenesis, hypoplasia and aplasia permit an accurate differential diagnosis

Special emphasis is placed on the development of cystic degeneration in an aplastic kidney This condition has also been described as multicystic or congenital cystic hypoplasia and not infrequently confused with unilateral polycystic kidney and multiple serous cysts of the kidney

The pathogenic and pathologic aspects of calcification, ossification and cartilage in the walls of the cystic type of aplastic kidney are discussed in detail The author has collected 16 cases of calcification of a cystic aplastic kidney and adds 2 personal cases

CONCLUSIONS

Les conclusions suivantes resultent d'une analyse critique de la litterature sur l'aplasie renale congenitale (avec ou sans degenerescence kystique), et des connaissances asquises grâce a l'etude detaillee de deux cas de degenérescence calcifiee kystique de'un rein aplasique congenital

1 Une definition exacte des trois anomalies importantes de la structure renale (agenesie, hypoplasie et aplasie) ets necessaire afin de permettre a l'urologiste et au pathologiste le diagnostic et la classification des cas

2 Les traits cliniques et pathologiques distinctifs de l'agenesie, de l'hypoplasie et de l'aplasie renales permettent un diagnostic differentiel precis

L'auteur insiste particulierement sur l'evolution de la *degenerescence kystique* du rein aplasique Cet etat a aussi ete decrit comme une hypoplasie polykystique ou hypoplasie kystique congenitale, et frequemment confondu avec le rein polykystique unilateral et les kystes sereux multiples du rein

Les aspects pathogeniques et pathologiques de la presence d'une calcification, d'une ossification ou de cartilage dans les parois du rein aplasique du type kystique, sont longuement discutes L'auteur a reuni 16 cas de calcification de reins kystiques aplasiques, auxquels il ajoute deux cas personnels

CONCLUSIONI

Viene fatt auna rassegna della letteratura sull'aplasia renale congenita associata o no a *degenerazione cistica* Sulla base di questi dati, e con l'esperienza di due casi personali studiati in dettaglio, si giunge alle *seguenti conclusioni*

1 E' necessario definire con esattezza tre importanti anomalie congenite del rene e cioe l'agenesia, la ipoplasia e l'aplasia, allo scopo di consentire agli urologi una esatta classificazione di ogni caso

2 Le tre condizioni hanno un quadro *clinico e patologico caratteristico, cosicche* e possibile una diagnosi differenziale

Una particolare attenzione merita la comparsa di una degenerazione cistica in un rene aplasico Questa affezione è stata descritta sotto il nome di ipoplasia multicistica o ipoplasia congenita cistica e spesso confusa col rene policistico unilaterale

e con le cisti sierose multiple del rene.

Vengono descritti dettagliatamente gli aspetti patogenetici e anatomopathologici della calcificazione, dell'ossificazione e della comparsa di cartilagine nella parete delle cisti del rene aplasico. L'autore ha raccolto 16 casi di calcificazione di rene cistico aplasico e ne ha aggiunti 2 di personali.

SCHLUSSFOLGERUNGEN

Die kritische Durchsicht der Literatur über angeborene Aplasie der Niere mit oder ohne zystische Entartung sowie die aus einer sorgfältigen Untersuchung zweier Fälle von verkalkter zystischer Degeneration einer angeborenen aplastischen Niere gewonnenen Kenntnisse führen zu folgenden Schlussfolgerungen:

1. Es besteht die unverkennbare Notwendigkeit einer genauen Definition der drei wichtigen angeborenen Nieren-anomalien, nämlich der Agenesie, Hypoplasie und der Aplasie, um dem Urologen und dem Pathologen die spezielle Diagnose und Klassifizierung der Fälle zu ermöglichen.

2. Die unterschiedlichen klinischen und pathologischen Merkmale der Agenesie, Hypoplasie und Aplasie gestatten eine genaue Differentialdiagnose.

Besonderes Gewicht wird auf die Entwicklung einer zystischen Degeneration in einer aplastischen Niere gelegt. Diese Veränderung ist auch als multizystische oder angeborene zystische Hypoplasie beschrieben und nicht selten mit einseitiger polyzystischer Nierenerkrangung und mit multiplen serösen Nierenzysten verwechselt worden. Die pathogenen und pathologischen Erscheinungen der Verkalkung, Verknöcherung und Verknorpelung in den Wänden der aplastischen Niere zystischer Art werden im einzelnen erörtert. Der Verfasser hat 16 Fälle von Verkalkungen zystischer aplastischer Nieren gesammelt und fügt zwei Fälle aus seiner eigenen Erfahrung hinzu.

CONCLUSOES

Uma análise crítica da literatura da aplasia renal congênita com ou sem degenaração cística, e do conhecimento obtido por um estudo detalhado de 2 casos de degeneração cística calcificada de um rim congenitalmente aplástico, leva às seguintes conclusões:

1. Há necessidade definitiva para uma definição exata das três anomalias congênitas da estrutura renal, isto é, agenesia, hipoplasia e aplasia, para capacitar o urologista e o patologista para diagnosticaram e classificarem adequadamente os casos.

2. As feições patológicas e clínicas distintas da agenesia renal, hipoplasia e aplasia, permitem um diagnóstico diferencial acurado.

Enfase especial é colocado no desenvolvimento da degeneração cística em um rim aplástico. Essa condição foi descrita como hipoplasia cística congênita ou multicística e não infrequentemente confundida com rim policístico unilateral e múltiplos cistos serosos do rim.

Os aspectos patogênicos e patológicos da calcificação, ossificação e cartilagem nas paredes do rim aplástico do tipo cístico são discutidas em detalhe. O autor coligiu 16 casos de calcificação de um rim aplástico cístico e acrescenta 2 casos pessoais.

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While Edwin Chadwick was showering circulars upon local Boards of Health, unaware that the days of his power were nearly over, a group of amateur projectors had organized a nursing home or private hospital intended for indigent gentlefolk. They had secured premises in the superior residential district of Harley Street. Marylebone, London, and they had appointed their superintendent, a young woman in her thirties. She would live in the house, and supervise the arrangements for nursing, strictly of course under the orders of the executive committees, of which there happened to be two, one of ladies and one of gentlemen. What a capable person they had found. A wonderful manager. And, quite surprisingly, a lady. The results were excellent. Daily expenditure was kept down, new ways found to economize, a complete revolution in patients' dietary, and a tendency for spiritual flirtations between the curate and the nurses nipped in the bud. Her secret was simple and efficacious. The Lady Superintendent believed that when a thing was to be done, she could best do it herself, so she labelled mixtures in the drug cupboard, regulated the gas stove, wrote cheerful letters to the patients' friends, she saw that the servants performed their duties, above all, she had managed the committees so well that, especially the gentlemen, they ate out of her hands . . . Florence Nightingale had fought hard to be allowed to do this indescribably wonderful work.

—*Williams*

A New Operative Technic for the Treatment of Prostatic Tumors

LUIS A SURRACO, M D, F I C S*

MONTEVIDEO URUGUAY

THE surgical treatment of prostatic hypertrophy has taken, at various times, various historic directions, according to the triple choice of approach canalicular, perineal and hypogastric Although the first must be considered occasionally artificial and entirely palliative, the two others, which have positive and definite value, are in accordance with the anatomotopographic and anatomopathologic actualities

On the basis of experience with thousands of patients, I have always considered the hypogastric approach preferable to any other—first, because of its simply regulated technic, easily performed and adaptable to any type of patient, second, because of the minimum operating time it requires, and third, because of its operative and postoperative benefits, both anatomic and functional whether considered from the point of view of the immediate effect or from that of the long-term results

In the hypogastric operation I have found the *intravesical technic,* fundamentally the extirpation technic of Fuller and Freyer, universally practical and successful By adding the modifications suggested by Marion, the French professor of urology—operation in two stages and the use of tampon plugging—I have been able, in my own practice, to obtain an overall mortality rate not exceeding 2 per cent

Posterior modifications in the hypogastric approach have culminated in a method that might well be given the name of the great English surgeon Millin, who devised, completed and promulgated it Following essentially the hypogastric technic, it has an intracanalicular variation that might be called hypogastric-extravesical and has received the support of most contemporary urologists I have performed it in many hundreds of cases, however, without being convinced of its superiority to the modified Freyer technic, performed in one stage and supplemented by transfusions and antibiotic therapy In fact, the more familiar I have become with Millin's operation the more I prefer the modified Freyer procedure and the more strongly I am convinced that it is superior to operation by the perineal approach

To evaluate the advantages of the hypogastric-vesical operation, one must isolate the elements forming its operative and postoperative equation, considering (a) the favorable aspects and (b) the dubious or negative aspects Then, having eliminated the latter by modifications of the technic, one can so analyze the problem as to justify one's claim to having devised a new and better operation

a *Favorable Aspects* — 1 The Freyer operation is the only one that permits complete removal of the tumor If necessary, *bimanual action is employed, with rectal support and perineal suspension* Extirpation is vesicoureteral, and the enucleation is done *en bloc* and not partially

The tumor is easily separated from the lateral prostatic wall but not so easily from the vesical neck Under the trigonal floor it appears as a mass surrounded by the sphincter encircling the periurethral

*Professor of Urology Montevideo

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glands. The technic permits one to avoid, in most cases, leaving small lobules separated from the tumor mass, which may easily occur with other types of intervention.

2. The Freyer procedure can be rapidly performed, which is its paramount value; no other technic permits so thorough an enucleation in so short a time.

3. As a result of bimanual intervention, enucleation in the Freyer operation is easy to achieve. The fingers of the enucleating hand, cleaving the vesical neck obliquely, controls completely and *en masse* the double vesical protuberance and the urethral protuberance of the adenoma. (Positive difficulties may be encountered in dealing with the pure types of fibrous and muscular syndrome [secondarily adenomatous] associated with so-called disease of the vesical neck, and in these circumstances Millin's operation is preferable.)

4. Loss of blood during the operation is easily controlled by simple dressings, and, owing to the shortness of the operating time, is minimal; it does not even approach the loss of blood that occurs with Millin's procedure. In the Freyer technic, what blood is lost at operation comes from two areas. The first is intraurethral, and loss of blood occurs when the adenoma is separated from the prostatic wall. The source of greatest hemorrhage one encounters in this region is the point of union of the posterosuperior angles of the prostatic wall and the posterior aspect of the vesical neck, supplied by two branches of the prostatovesical arteries; this can be observed readily by a surgeon performing Millin's operation. There is another vesicocervical branch in contact with the more or less accentuated cleavage of the vesical cervical mucosa, but the former, which, being more abundant and generally arterial, may cause the loss of many grams of blood in a short time, can be easily controlled by dressings, while the latter, giving rise to the less intense venous type of hemorrhage, cannot be controlled by urethral dressings, though it may be stopped, when well localized, by simple pressure with a compress for some minutes.

5. Postoperative loss of blood, which occurs during the first twelve hours (and in some cases is important—e.g., when the bladder and prostate are enlarged and hypertension is present), supposing the hematologic situation to have been well controlled beforehand, is generally far less severe than that associated with other operations, such as the Millin procedure. With them the extent of the hemorrhage is usually obscured by continual washing. Only exceptionally does the Freyer operation, if skillfully done, require the employment of a blood transfusion.

6. The peritoneal reflexes remain unaltered. Only infrequency does one encounter, as one often does with Millin's procedure, the syndrome of subperitoneal reaction as a result of loss of blood or urine in the prelateral or the laterovesical areas.

7. The anatomic and functional morbidity rate, both immediate and late, is low. This refers to the syndrome of micturition; the procedure does not result in immediate dysuria and has a favorable effect on polyuria; it preserves the lumen of the posterior portion of the urethra, which is sometimes much narrowed after the use of other technics. In addition, it conserves the permeability and contractility of the vesical neck, which after other procedures is transformed into a fibrous ring or presents a valvular obstruction.

b. "*Negative Aspects.*—1. The Freyer operation has been criticized as a "blind operation," which actually it is not, since exact control is obtained by the bimanual technic.

2. It is said to produce lacerations in certain zones of the vesical mucosa, which it does not if the surgeon keeps his finger

exactly against the lobes to be enucleated and if the posterior face is completely cleared and the work is done precisely under the trigonal floor

3 Certain critics have also maintained that neither operative nor postoperative hemorrhage can be well controlled if there is a large vesical protuberance or if hypertension is present, with strong tensional oscillations, either during or after the operation This is not true if the dressings are properly applied and pressure is maintained continuously for the period required by my technic

4 The permanence of the pack in the prostatic cavity is said to cause pain and desire to micturate, with vesical contractions and radiation of the pain to the perineal region This is, of course, a valid and important objection, even when one neutralizes the pain by large doses of stilbestrone during retention of the pack

5 Pain is caused also by withdrawal of the pack This is another valid objection

6 Some claim that convalescence and the closing of the bladder are slow and that the patient is kept too long in bed This was valid with regard to the original Freyer technic, but I have been able, through my modifications of the procedure, to bring the process to an end and the patient to his feet with a closed bladder in three weeks or less

7 Some critics maintain also that drainage from the floor of the bladder is incomplete and that permanently infected urine is left after the operation This applies to other procedures and has no significance as a criticism of the technic here presented

Suracco Technic — My own technic is directed toward retaining the real anatomic and functional advantages of Freyer's operation and meeting the objections I have mentioned as valid It solves all problems connected with (1) technic and operating time, (2) control of hemorrhage, (3) simplicity of operation, (4) suppression of pain, (5) quick closure of the bladder, and (6) shortening of the time the patient must spend in bed

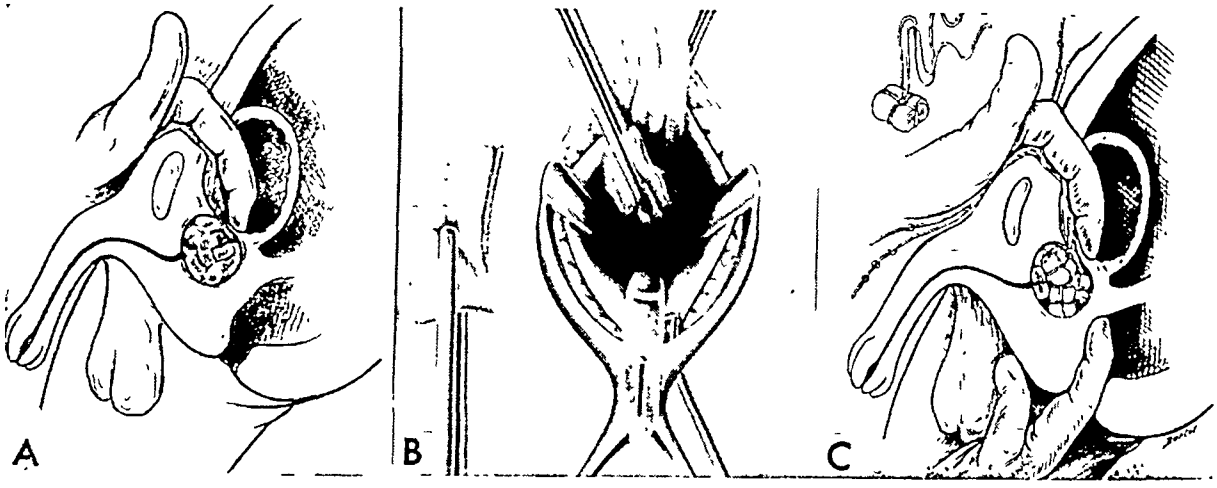
Time Schedule Each patient is prepared for the operation by preliminary attention to coagulation and hemostasis Two days before operating I give him two daily injections of calcium chloride, and during the operation, if necessary, I employ blood transfusions These, however, are not required in dealing with the urethral type, a small prostate, a small prostatic neoplasm or the syndrome of disease of the vesical neck Preferably the operation itself is performed in one stage, if more than one is required, I mobilize the bladder, in advance, from the parietal area and the posterior face of the pubis

Actual Technic The approach to the hypogastric wall and the vesical area is made by (a) a cutaneous incision along the median line, extending to the aponeurotic plane, (b) a paramedian incision of the anterior sheath of the rectal capsule, and (c) inward separation of the pyramidalis, care being taken not to cut the lower points of its insertion of its capsule into the prepubic area and to preserve the pubic bone so as to leave a pivot that will resist posterior closure of the aponeurosis

As I have more than once insisted in my works on regional anatomy and on my discovering my personal method of vesical approach, it is a technical mistake to cut the white line and enter deeply through it, as is usually done With other procedures, separation of the rectus muscles is generally allowed, and the aponeurotic column of resistance represented by the white line is destroyed, therefore, an aponeurotic diastase remains in the scar, with immediate or almost immediate progressive eventration

The rectus is separated outward and freed from the posterior aspect of its sheath

The umbilical prevesical cavity is opened



A, finger pressure continuously exerted on packed prostate cavity. *B*, gauze held with long nipper inserted into cavity to determine the status of coagulation. *C*, cavity filled with paper packing described in text, with finger pressure (see text).

to expose the umbilical allantoid plate without entering Retzius' space.

The umbilical allantoid plate is torn to expose the highest portion of the anterior aspect of the bladder.

The bladder is opened at this highest point. This incision is made as short as possible by separating the ends with forceps.

The following points are representative of my own modifications:

The prostate is enucleated by the bimanual Freyer-Marion method, if possible as a single mass surrounded by the intraglandular sphincteric fibers. Above all, effort is made to prevent tearing the vesical mucosa, which causes profuse venous hemorrhage, some degree of which, at this point, is inevitable in spite of the dressing.

In 1925 I published in the *Journal of Neurology* (No. 4) an article entitled "Prostatism, Prostatectomy and the Urethral Closing," in which I developed the thesis that enucleation could be done by dissecting the adenoma from the flat sphincterian envelope that covers it, and that this would result in a narrower opening of the enucleation cavity, and less laceration of the mucosa of the vesical neck, which would simplify hemostasis and shorten the time required for packing and continuous compression.

The enucleation cavity is completely packed, as though the pack were to be permanent. The packing is followed by continuous manual pressure, *which is the basis of my modification of the technic and upon which the success of the operation depends.* The packing should be accurately completed under the posterior aspect of the vesical neck, for it is in this area that vesicoprostatic arterial branches are present bilaterally and are the most important sources of hemorrhage produced by the surgical trauma of enucleation. By finger pressure within the bladder (see illustration, *A*) I press against this packing the whole posterior aspect of the vesical neck, mobilizing the trigone to exert stronger and more constant pressure. This maneuver is aided by support from the right hand. To strengthen the pressure, the surgeon may introduce into the bladder the end of a gauze strip similar to that used for packing, applying it strongly against the operative field, pushing forward and downward the entire vesical neck and the trigone. *This is the fundamental point in my technic. Such compression, properly applied for the length of time, will insure the success of the operation, complement-*

ing and justifying all the steps leading up to its employment.

It is based on the fact that at the moment of enucleation a large bleeding surface is revealed, containing arteries, especially in the interior lateral aspects of the vesical neck—an area capable of producing massive venous hemorrhage, lessened or accentuated according to the extent to which the vesical mucosa has been torn. Immediate packing to fill the cavity and manual pressure against this bleeding surface, applied as aforedescribed and continued for the length of time required to accomplish coagulation, is vital. Pressure must never be used for less than fifteen or twenty minutes; it may need to be maintained for twenty or twenty-five and occasionally for thirty or forty minutes.

In most cases continuous pressure for fifteen to twenty minutes is sufficient. If complete hemostasis is obtained, it will hardly be necessary to repeat the process when the packing is removed.

On the other hand, strict control must be maintained in the following instances:

a. When the prostate is large and causes strong vesical protuberance, especially if it is everted through the half-open vesical neck.

b. When hypertension is present, especially when strong tensional oscillations are observed during the operation, or when the tension rises under transfusion or as a result of the use of vascular and humoral stimulants.

c. When the prostate causes vesical protuberance, congestion is marked and hematuria or urethrorrhagia is present.

d. When a prostate that causes extreme vesical protuberance is strongly retained, or when the patient has a generally congestive diathesis or has not been kept at rest with an indwelling catheter for a sufficient length of time.

Only after fifteen or twenty minutes of continuous pressure is it possible to inspect the bottom of the vesical cavity. For this purpose I introduce into the bladder the Marion trivalvular separator, and by its light pass a long nipper with a piece of gauze (see illustration, *B*). This will clean the bladder and can be drawn up to the dressing plane. If the gauge comes out soaked with fluid blood, pressure is repeated. If it carries coagulum only, or if it comes out clean, the final maneuver can be undertaken.

Removal of the Packing: The packing is drawn out very slowly, the condition of the resulting breach being repeatedly checked by means of new examination packs. When it is favorable I remove the gauze entirely; if at some moment the examination pack comes out with fluid blood, I cease withdrawing the gauze and watch the field for a moment before proceeding. If this happens continuously, or if hemorrhage occurs, I insist upon renewed continuous pressure for as long as may be necessary. All these precautions make it possible to remove the packing after a short time and always under the same control (see illustration, *C*).

Packing Materials: I have introduced an important variation in the procedure by performing tamponage of the prostatic cavity with wicks of certain kinds of paper, the coagulating properties of which are known. Among these, I find ordinary sterilized toilet tissue outstanding. It is easy to handle; it is made of cellulose pulp obtained from pine and poplar, and it is processed in such a manner that it has long fibers. In addition, it contains no resinous material. All these characteristics combine to make it well adapted to the surfaces with which I place it in contact, and, as has been stated, it has a strong coagulating power.

I have used this paper in two ways: first, by placing it inside the gauze strips commonly used, where, once dampened by the blood, it can exert its coagulating

power; second (and better), by applying it directly to the bleeding surface of the prostatic cavity. By this means, and because of the more intimate contact, I provide the best possible environment for its coagulating qualities to exert their influence. The result is striking. No sooner has the cavity been filled with balls of this paper, and continuous pressure exerted thereon for a suitable interval, than the emergence of blood from the vesical opening ceases entirely.

The paper is prepared for use by placing several sheets together, pleating them and then rolling them into balls of different sizes. These are tied circumferentially around both diameters with linen thread, one end of which is kept long for controlling the insertion and withdrawal of the ball (see illustration, *C*).

After enucleation of the prostate I proceed as I have indicated for the use of gauze packs, placing the paper balls into the cavity until it is entirely filled. Bimanual compression, intravesical and rectal, is then exerted for the fifteen or twenty minutes stipulated. Withdrawal of the paper balls is then undertaken, in reverse order; i.e., the last ball inserted is the first to be withdrawn, etc. This can be facilitated by marking the withdrawal thread with knots in numbers corresponding to the sequence of insertion.

If it is desirable to narrow the vesical orifice, I insert a Freyer-Marion tube. The parietal plane is closed by my technic of approach. The upper part of the rectus sheath is closed by approximating the severed edges of its anterior face. The same rectus sheath is closed inferiorly by joining the external severed edge of this same face to the pyramidal capsule, which has been kept intact. Thus, in the final cicatrization of the wound, there is left a powerful plane of hypogastric resistance, resting upon the median aponeurotic line, which also has been left entirely intact.

In most of my cases the Freyer-Marion tube is left in place for twenty-four hours when there has been no bleeding from the beginning of the postoperative period. This applies especially when the prostate is small and the urethrovesical protuberance moderate; when the prostate is neoplastic but small, and in the presence of a fibrotic vesical neck.

After twenty-four hours, then, I remove the hypogastric drain and insert an indwelling catheter, not exactly at the same point but a little higher in the bladder, in order to prevent small coagulations from obstructing it. On the following day this is removed and the area is washed. On the second day of catheterization the tube is placed 2 or 3 cm. away from its former position, and from that moment the bladder will be virtually closed. If there has been no interruption of the drainage, closure may be considered complete and the urethral catheter withdrawn seven days later.

The following advantages are gained:

My parietal approach and the brief operating time it requires enable me to respect the anatomic and functional integrity of the wall, thus preventing what is a common occurrence with other technics —section of the white median aponeurotic line, which provokes eventration immediately after the operation or a little later.

The control of hemorrhage, that *bete noir* of all surgical procedures, is within the surgeon's power. To reemphasize the main points, this is accomplished by the following steps:

Complete packing of the cavity and continuous pressure of the vesical neck and the trigone against the zone of enucleation, and maintenance of the pressure for a period never under fifteen minutes, sometimes twenty minutes and, in exceptional cases, thirty or forty minutes.

Inspection of the floor of the bladder

before removing the packing. This is done by introducing, by means of the light of the Marion trivalvular separator, an instrument to which is attached a piece of gauze for repeated inspection.

Slow and careful removal of the packing after the lapse of time required for coagulation.

The operation is simple and quick, as is the case with any procedure of the Freyer type, and as it is not with any prostatectomy technic. Both pain and urethrovesical spasm produced by leaving the packing too long against the hemorrhagic area (which sometimes creates new hemorrhages as well) are obviated. Pain on removal of the packing is suppressed also, owing to the shortness of the period for which the packing has been used. Also, occasional and sometimes painful hemorrhages, which have been known to result from leaving a pack in place for many days, are avoided. The bladder can be closed quickly — on the first or second postoperative day, according to the time of withdrawal of the hypogastric tube and the state of urethral drainage from the moment of its withdrawal. The patient's confinement to bed is brief, and micturition is restored within eight to twelve days.

In my experience this operative technic, when carried through with meticulous attention to all details as aforedescribed, has given excellent results. In my opinion it deserves wider application in the surgical treatment of prostatic tumors.

SUMMARY

The author recommends the hypogastric surgical approach to prostatic hypertrophy due to tumors of the prostate. His recommendation is based on (1) its technical simplicity, (2) the brief operating time it requires and (3) the results, both immediate and long-standing, obtained by himself and others through its employment. His own technic, together with his principles of preoperative and postoperative care of the patient, is presented in detail.

Its effectiveness, on the basis of his own experience, depends to a great extent upon meticulous attention to the details of the technic as described. He points out that, if these details are carried out properly, the patient will be confined to bed only briefly and that micturition will be restored within eight to ten days after the operation.

RÉSUMÉ

L'auteur recommande l'approche hypogastrique chirurgicale pour L'hypertrophie prostatique causée par des tumeurs du prostate. Su recommendation sa base sur les trois raisoons suivants:

1. La simplicité technocale.
2. La brièveté du temps operatoire.
3. Les resultats favorables, immediats et finals, que non seulement lui, mais d'autres aussi ont obtenu.

L'auteur riscute l'état et le soin pré et post operatoire du malade.

RESUMEN

El autor trata del tratamiento quirúrgico de los tumores de la prostata, con las indicaciónes y contraindicaciónes para intervención. Es muy recomendable el acceso hipogástrico, á causa de tres razones:

1. Simplicidad técnice.
2. Brevedad de operasión.
3. Los resultados benignos, inmediato y último.

El autor trata del condición del paciente pré y post operatorio y presente uno técnico quirúrgico personal por lo tratamiento de los tumores prostáticos.

RIASSUNTO

L'autore tratta la terapia chirurgica della prostata, esprimendo l'opinióne che l'accèsso ipogástrio e la cura addata. Questo metódo é racommendabile a causa di tre motivi:

1. La simplicità tecnica.
2. La brevità dei tempi dell'operazióne.
3. Il effetívo propízio, primatíccio e definitívo.

L'autore descríve la condizíone prima anzi in seguíto all'operazíone. Egli pronunzia con enfasi una tècnica chirúrgica personále in la cura dei tumóri della pròstata.

Intense ear-ache with acute fever and one of the other bad signs, proves fatal to young people in seven days or fewer, unless there is a copious discharge of pus from the ear, or epistaxis, or some other favourable sign. Death is preceded by delirium. In the case of older people, the illness is less acute and less fatal as there is longer in which the ear may discharge pus. Also, old people are less liable to delirium; nevertheless most of them relapse and then die.

The onset of deafness in the course of acute difficult illnesses is a bad sign; it is also bad in protracted cases for in these it also brings on pains in the hips.

In fevers, deafness checks diarrhoea.

It is a fatal sign if the ears be cold, translucent and contracted.

Buzzing and noises in the ears is a sign of death in acute diseases.

Noises in the head with dimness of vision and a heavy feeling in the nose is a sign of delirium, and leads to haemorrhage.

Those who suffer from deafness with heaviness of the head, distension of the hypochondrium and photophobia, have a haemorrhage.

In an acute fever, the onset of deafness indicates dementia.

To be hard of hearing, to show tremor in picking up anything, to have a paralysed tongue, to be sluggish—is bad.

It is a sign of delirium when, following a period of ill health, deafness supervenes and the urine is reddish with particles suspended in it but fails to form a sediment. Jaundice is bad in such cases, as is imbecility supervening on the jaundice. It sometimes happens that the patient loses the power of speech without losing consciousness; the belly may also be in a bad state.

—*Hippocrates*

The Surgical Treatment of Trigeminal Neuralgia

WALLACE B. HAMBY, M.D., F.A.C.S.

BUFFALO, NEW YORK

TIC douloureux, or trigeminal neuralgia, has been known for centuries. According to Krause, Avicenna gave an accurate description of the disease about 1000 A.D. Peet[1] quoted John Locke's letter dated December 4, 1677, describing tic pain very vividly. In 1773 Fothergill[2] of England described it so well that English-speaking physicians have dubbed it Fothergill's neuralgia. In 1756, Nicholas André[3] of France gave the disease the picturesque name under which it usually goes at present. In 1821, Charles Bell of England and Francois Majendie of France almost simultaneously demonstrated that sensation from the face is mediated over the trigeminal and not the facial nerve. Not until much later was tic douloureux recognized as a disease of the trigeminal nerve. Even Bell believed it probable that the pain was sympathetic in origin and speculated on the possibility of sympathectomy as a treatment. The practice of cutting or avulsing the facial nerve in a desperate effort to control this agonizing pain was not abandoned until the middle of the nineteenth century.

Recognition of the origin of the pain in the trigeminal nerve led to treatment by avulsion of the peripheral nerves. Their regrowth, of course, limited the usefulness of the procedure. In 1828, John Warren[4] of Boston described trephining the mandible to perform the first division of a nerve proximal to its exit. The tendency of the disorder to affect two or all divisions of the nerve simultaneously led surgeons backward toward the point of common origin.

At the 1884 meetings of the American Surgical Society in Philadelphia, Dr. John E. Mears[5] discussed the disease and proposed resection of the gasserian ganglion.

It was not until four years later, on November 15, 1888, that Victor Horsley[6] first successfully resected the second and third divisions of the trigeminal intracranially. His second operation, on January 6, 1890,[7] was successful in relieving the lower facial pain, but it recurred several months later in the ophthalmic branch. In the November 1, 1892, issue of *The Lancet*, William Rose[8] of London, described the first operation for the removal of the gasserian ganglion. Although this procedure stopped the pain, the operation was complicated by prolonged suppuration of the wound and final loss of the eye from infection secondary to corneal ulceration. Rose's operation was a difficult and mutilating one, but a number of surgeons tried it with varying degrees of success. Horsley persisted with his temporal intradural approach.

On August 8, 1891, Hartley[9] of New York resected the second and third divisions of the trigeminal nerve via a temporal extradural approach. Fedor Krause[10a] of Berlin independently did the same operation on February 23, 1892. At

From the Buffalo General Hospital and the University of Buffalo School of Medicine

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Summary of Experience at Buffalo General Hospital with Operations for Trigeminal Neuralgia

Primary Operations		Secondary Operations: Temporal Rhizotomy	Suboccipital Rhizotomy	Sheldon Procedure	Taarnhøj Procedure	Tractotomy	Contralateral Operations*	Total	Deaths
Temporal rhizotomy	168	20	1		2		4	195	2(1 %)
Suboccipital rhizotomy	30		1					31	0
Tractotomy	41	9			2	4	2	58	2(3.4%)
Sheldon procedure	20	2						22	1(5 %)
Taarnhøj procedure	30	7		1	5		1	44	0
		38	2	1	9	4	7	350	5(1.4%)

*Operations performed secondarily after an operation for tic, because of the development of pain on the opposite side.

the time, some acrimony developed between the two surgeons over priority; now their names are often joined in terming this the Hartley-Krause approach to the trigeminal nerve. The original aim of this operation was the extradural section of the second and third branches of the nerve. But these branches could and did regrow, and the pain recurred. In 1893 Krause[10b] extended his operation further and resected the gasserian ganglion via the epidural approach.

The gasserian ganglion is intimately a part of the wall of the cavernous sinus, which contains the third, fourth and sixth cranial nerves, which supply the eye muscles. Removal of the ganglion, necessarily "a dangerous and bloody business," was followed in a high percentage of cases by ipsilateral ophthalmoplegia and corneal ulceration, frequently causing loss of the eye. In 1898, Hutchinson[11] suggested excising only the part of the ganglion attached to the second and third branches, saving the first division and thereby preserving corneal sensation.

In 1898 the Philadelphia neurologist W. G. Spiller,[12] noting that severed posterior spinal nerve roots did not regenerate, proposed to his surgical colleague, Charles Frazier, that this principle might apply to the trigeminal nerve. On Dec. 11, 1890, Horsley had divided the sensory root at the end of a frustrating, unsuccessful attempt to resect the ganglion, but the patient died, apparently of shock. On Oct. 12, 1901, Frazier performed the first successful division of the sensory root. It is interesting that he preserved the motor root until near the end of the operation, when it was accidentally torn. Preservation of the motor root became routine. Other refinements rapidly developed. Within ten years Frazier[13] could report 300 cases of tic douloureux so treated. Peet[1] described saving the first division fibers when only the lower part of the face was involved.

In 1917, Doyen[14] proposed resection of the sensory root at the pons by a suboccipital approach and Dandy[15] made this his operation of choice. He claimed that pain could be abolished there by cutting the posterior half of the root, without numbing the face. This approach has been pursued by Walker[16] of Atlanta, who can do the operation through a generous-sized drill hole.

Partial resection of the trigeminal root became the standard treatment for tic douloureux and was, as late as 1945, acclaimed the most perfect operation in surgery. Performed most often on patients more than 60 years of age, with a mortality rate of less than 1 per cent, to relieve one of the most agonizing afflictions to which mankind is heir, at the cost in morbidity of only partial loss of sensation in

part of one half of the face, this characterization seemed justified Neurosurgeons, however, perfectionists that they are, continued to set the goal at relieving the pain without loss of sensation

Trigeminal Tractotomy—In 1911, Spiller[17] showed that, after entering the brain stem, trigeminal touch fibers cross and ascend at once, but the pain and temperature fibers descend in the spinal tract through the upper cervical portion of the cord before going toward their destination in the thalamus In 1938, Olaf Sjoqvist[18] of Stockholm devised a method by which this tract could be interrupted, calling it "trigeminal tractotomy" The operation consists of exposing the medulla at the outlet of the fourth ventricle and making a precisely placed incision in its posterolateral aspect Unfortunately, the pain tract occupies a position that prevents complete section of all the fibers without damage to important adjacent tracts The fibers to the "muzzle area" of the face are the ones hardest to divide, and these areas contain the "trigger zones" most often affected by tic douloureux Sjoqvist's operation, then, did not replace trigeminal rhizotomy as the operation of choice in the usual case of tic douloureux It is an excellent treatment for "first division tic" or for use on the second side when the condition is bilateral, especially if the motor root has been damaged at the first operation Tractotomy carries no risk to the motor root

Decompression of the Trigeminal Root—In 1952 P Taarnhøj[19] of Copenhagen described a new method of relieving tic pain without desensitizing the face Through a small temporal craniotomy he opened the dura and lifted the temporal lobe from the floor of the middle fossa, exposing the tentorium and the dura over the sensory root The dura over the root was identified and opened, the incision extending backward to slit the tentorium to its free medial border The superior petrosal sinus was transected, laying wide open the porus trigemini, the dural ring through which the root extended from the middle to the posterior fossa Interestingly enough, this stopped the tic pain, and, since the root was not damaged, no numbness resulted When other neurosurgeons, more familiar with the older rhizotomy, immediately altered the operation to permit its being done largely epidurally, they obtained the same result This new operation differs from all its predecessors in avoiding section of any part of the trigeminal system As might have been safely predicted, the phenomenon called forth a number of speculations on the reason for the success and the still unproved primary cause of tic douloureux

In 1954 Arest Stender[20] of Berlin reported that he had brought about relief of tic douloureux by simply exposing the sensory root and the gasserian ganglion and stripping the dura propria off its surface He called this 'trigeminal ganglyolysis"

For several years, Hunter Shelden[21] of Pasadena had been exposing and enlarging the foramens ovale and rotundum, through which the second and third divisions enter the skull Usually the pain was relieved He noticed that after these operations and those done by the Taarnhøj method, mild sensory defects were observed in the skin of the face In 1955 he reported the same effect from simple exposure of the sensory root and gentle compression of the root with blunt instruments

It seems likely, then, that the effect of Shelden's, Stender's and Taarnhøj's operations is much the same, and that opening the porus trigemini is not essential in Taarnhøj's operation An interesting phenomenon follows these operations: the pain may not be relieved immediately, occasionally it declines all a

week or so. In the days of routine partial rhizotomy, pain persisting the day after the operation was considered evidence of incomplete section. The wound was reopened and more fibers were severed. Memories of such cases made some surgeons reluctant to accept the new operations.

The long-term effect of these newer operations is not yet known. Pain recurs in some patients. In my own experience (see table) pain has recurred after 13 (43 per cent) of 30 Taarnhój operations, severely enough to require reoperation in 6 cases (20 per cent) and rhizotomy in 7 (23 per cent). Since Nov. 2, 1954, I have done 20 Sheldon operations; in 2 instances (10 per cent) reoperation and rhizotomy were required. My series of primary temporal trigeminal rhizotomies numbers 168. I have always conserved as much of the root as possible, which has made necessary reoperation and more extensive rhizotomy in 23 cases (21 per cent). It is interesting that, of the 30 suboccipital rhizotomies, only 1 has required repetition and none has required later subtemporal rhizotomy. I have done 41 trigeminal tractotomies[22] for tic douloureux. Six (17 per cent) of the patients required subsequent operations and later rhizotomy to control residual pain in 9 (22 per cent).

At the current stage of knowledge it seems justifiable to perform the simpler Shelden-Stender operation for tic douloureux. The patient is told that experience thus far indicates a 70 per cent chance of relief of pain without noticeable sensory loss in the face. Should the pain recur, it is relatively simple to reopen the wound and sever the fibers.

Other Forms of Treatment.—It seems safe to state rather dogmatically that, thus far, surgical intervention offers the best therapy for tic douloureux. The use of vitamin B_{12}, enthusiastically hailed recently, has proved only to permit, perhaps, earlier remission of an individual attack. The parenteral administration of stilbamide does selectively damage the fifth nerves, but it requires six to eight weeks to be effective, numbs both sides of the face and leaves the patient with annoying bilateral paresthesias. The results certainly are not as benign as are those of operation.

Injection of alcohol into the peripheral branches of the nerve is temporarily effective but must be repeated as the nerve regrows. Each succeeding injection is less effective than the last and eventually the treatment fails.

Alcohol injection of the gasserian ganglion has been developed to a high degree of effectiveness by the English, but is more time-consuming, uncomfortable and capricious in its effects than is operation. Few American surgeons have developed an aptitude for the procedure.

SUMMARY

Trigeminal neuralgia (tic douloureux) has been known for centuries. Recognition of the fact that the pain originated in the trigeminal nerve led to the practice of avulsing the peripheral nerve branches. The effect of this procedure, however, was limited by their regrowth. The tendency of the disorder to affect two or all divisions of the nerve simultaneously led surgeons backward toward the point of common origin. Eventually, partial resection of the trigeminal root became the standard treatment for this malady. As late as 1945 it was described as the "most perfect operation in surgery."

Trigeminal tractotomy, decompression of the trigeminal root and other procedures appeared successively as neurosurgeons strove to improve still further the results of the various types of intervention.

The modern surgical treatment of tic douloureux permits relief of pain without

anesthetizing the face in approximately 70 per cent of patients In those requiring subsequent rhizotomy it is rarely necessary to produce total facial anesthesia The operation is safe (mortality rate, about 0 5 to 1 5 per cent) even in the advanced age brackets to which these patients belong The operation does not produce facial paralysis, except temporarily in 2 to 3 per cent of patients Small temporal scars located behind the hairline are invisible after the hair regrows, there is no deformity The operation, though it requires precision, usually is performed in twenty to forty-five minutes The patient is usually able to leave the hospital on the fifth postoperative day

RÉSUME

Le traitement chirurgical moderne du tic douloureux permet le soulagement de la douleur sans anesthesie de la face dans environ 70% des cas Lossqu'il est necessaire de pratiquer une rhizotomie secondaire l'anesthesie faciale est rarement indispensable L'operation est sans danger (taux de mortalite 0,5 a 1,5%), même dans le groupe d'âge avance auquel appartiennent ces malades

L'operation ne produit pas de paralysie faciale excepte, temporairement, dans 2 ou 3% des cas Les petites cicatrices qui subsistent deviennent invisible apres la repousse des cheveux, il n'y a pas de deformation L'operation, bien qu'elle demande une grande precision, ne dure pas plus de 20 a 40 minutes Le malade peut quitter la clinique au cinquieme jour postopératoire

RIASSUNTO

La cura chirurgica moderna del tic doloroso consente di ottenere in circa il 70% dei casi l'abolizione del dolore senza dover anestetizzare la faccia Anche in quei malati in cui e necessaria la rizotomia successiva, raramente si deve produrre una anestesia totale della faccia L'intervento e sicuro anche nei pazienti di eta evanzata ed ha una mortalita del 0,5 1,5%

Esso non deve dare paralisi facciale se non temporanea e soltanto nel 2 3% dei casi Le cicatrici sono minime e situate dietro all'impianto dei capelli cosicche sono assolutamente invisibile quando i capelli ricrescono

Richiede dai 20 ai 25 minuti di tempo, nonostante la grande precisione necessaria I pazienti di solito lasciano l'ospedale dopo cinque giorni

SUMARIO

O tratamento cirurgico moderno do tic doloroso permite aliaviar a dor sem anestesiar-se o rosto em aproximadamente 70% dos pacientes Naqueles que necessitam rizotomia subsequente raramente torna-se necessario produzir anestesia facial total A operação e segura (media de mortalidade 0 5 a 1 5 por cento), mesmo nos grupos de idade avançada ao qual êsses pacientes pertencem

A operação não produz paralisia facial, exceto temporariamente em 2 a 3% dos pacientes Pequenas cicatrizes temporais localizadas atras da linha do cabelo tornam-se invisiveis depois que o cabelo torna a crescer, não ha deformidade A operação, embora exija precisão e usualmente feita em 20 a 45 minutos O paciente pode comumente deixar o hospital no 5° dia pos operatorio

ZUSAMMENFASSUNG

Die moderne chirurgische Behandlung des tic douloureux fuhrt bei etwa 70 Pro-

zent der Kranken zur Schmerzbefreiung, ohne eine Unempfindlichkeit des Gesichts hervorzurufen. Nur selten entsteht in Fällen, bei denen eine anschliessende Nervenwurzeldurchtrennung erforderlich ist, die Notwendigkeit, eine völlige Gesichtsanästhesie herbeizuführen. Die Operation ist auch in der vorgerückten Altersgruppe, der diese Kranken angehören, gefahrlos. Die Sterblichkeitsquote schwankt zwischen 0.5 und 1.5 Prozent.

Mit Ausnahme von vorübergehenden Zuständen in zwei bis drei Prozent der Kranken kommt es als Folge der Operation zu keinerlei Gesichtslähmungen. Kleine Narben hinter der Haarlinie werden nach Wiederbeginn des Haarwuchses unsichtbar, und es entstehen keinerlei Entstellungen. Die Operation muss zwar präzise ausgeführt werden, dauert aber im allgemeinen nicht länger als 20 bis 45 Minuten. Gewöhnlich kann der Patient am fünften Tage nach der Operation aus dem Krankenhaus entlassen werden.

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The spirit of inquiry is admirable if it is really inquiry and not uncritical novelty worship It is right that we should examine and consider every new thing that is presented to us, but not necessarily right that we should adopt it Most new things turn out in the end to be wrong When presented with a new project for acceptance, we should first ask 'Is it reasonable?' Then, 'Is it really new? Has it, or anything like it, been tried before? If so, has it failed, and why? Was the failure due to some inherent defect, or to some circumstances that can now be remedied? If it is reasonable but yet untried, can it be tried without risk? If there is a risk, how can that risk be eliminated or minimised? Are we justified in a full scale trial, or should we first try a pilot experiment? Can the experiment be done first on ourselves?'

—*Ogilvie*

Cerebral Paragonimiasis

Report of Three Cases

S. K. WANG, M.D., AND C. J. SHIH, M.B.

TAIPEI, TAIWAN, CHINA

PARAGONIMIASIS is a parasitic disease, caused by the fluke Paragonimus ringeri (Westemanii). The disease is known to exist endemically in certain Far Eastern nations, Japan, Korea, China, particularly Taiwan (Formosa) and the Philippines. The miracidia of the parasite infest certain fresh water mollusks and become cercariae in their intermediate host. From this host the cercariae go to certain fresh water crabs and become encysted in their second intermediate host, either in the liver or in the gills. In these countries people have the habit of eating raw crabs, so a large number of the inhabitants may harbor this parasite. The fluke, after leaving the cyst, goes through the intestinal wall to the abdominal cavity. Thence it perforates the diaphragm and enters the pleural cavity, and finally penetrates the lung to become encysted there. The lung is its most favorable site, so the parasite is commonly known as lung fluke, though it may also invade other tissues and organs. Patients infested with this parasite usually have a chronic cough and expectorate rusty-brown sputum; even frank hemoptysis may be present. The characteristic ova are constantly present in the sputum, and their identification establishes the diagnosis.

Next to the lung, the brain is the most frequent site of the disease. Of the 201 cases exhibiting extrapulmonary involvements collected by Sung,[1] 93 showed signs and symptoms suggestive of a cerebral localization.

The cerebral involvement of Paragonimus infestation was first reported by the Japanese author Otani[2] in 1887. Mitsuno and his associates[3] in 1952 made a comprehensive review of this subject and were able to collect 158 reports of such cases from the literature. They found that in more than two-thirds of the cases the diagnosis was made on clinical grounds alone. In 38 instances the cerebral involvement was verified by postmortem examination; in only 14 instances was the clinical impression confirmed by operation. They reported 7 additional cases of their own (5 operative cases and 2 autopsies). Since then, more cases have been reported by other authors,[4] but, up to the time of writing, the total number has not exceeded 200.

Invasion of the brain by the Paragonimus parasite eventually results in the formation of localized cystic granulomas, which produce symptoms and signs that cannot be differentiated from those of other space-occupying lesions. They are definitely amenable to surgical attack. The scarcity of reports of successful surgical treatment, in our opinion, is due to the fact that the disease is limited only to those areas in which modern neurosurgical technic has not yet been fully developed, and that most of the patients were thereby denied the benefit of such therapy.

In the past two years we have had the opportunity of caring for 3 such patients. They all had cerebral paragonimiasis, but they were in different stages of the disease. The first patient was apparently in the rather acute stage; the parasites were

From the National Defense Medical Center, Taipei.
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producing a widespread inflammatory reaction in the brain. The disease process had not yet been localized, and the patient eventually died as a result of mounting intracranial tension. The second patient was in the subacute stage. Although he had symptoms and signs of intracranial hypertension, the lesion was fairly well localized. We were able to excise the parasitic granulomas completely, and the patient was cured. The third patient, a woman, was in the chronic stage. The lesion was not only localized but partly calcified. The patient was not suffering from intracranial hypertension but rather from irritations originating in a cerebral focus. Accordingly, she was well taken care of under anticonvulsive management. The clinical history of these 3 patients is presented here.

REPORT OF CASES

CASE 1.—Y. H. C., a 31-year-old Chinese lieutenant, was admitted to the First General Hospital on Nov. 6, 1954, for headache, nausea, vomiting, and blurring of vision of eight months' duration. He became completely blind about one week prior to admission. At about the same time, urinary and fecal incontinence also developed.

Physical examination on admission revealed the patient to be well developed but moderately undernourished. Mentally he was somewhat cloudy, but was still cooperative and able to answer questions. Both his eyes were completely blind. Examination of the fundi revealed bilateral choked discs (7-8 diopters). Some mild incoordination of the upper extremities was demonstrated by finger-to-nose test.

Laboratory examination revealed secondary anemia, with 65 per cent hemoglobin and 3,400,000 red cells per cubic millimeter of blood. The leukocyte count was 7,200 per cubic millimeter, with 70 per cent polynuclear neutrophils, 24 per cent lymphocytes, 4 per cent monocytes and 2 per cent eosinophils. The urine was clear. The stool contained ascaris ova.

Lumbar puncture revealed clear cerebrospinal fluid with a pressure of 320 mm. of water. It contained 72 leukocytes per cubic millimeter. Other values were as follows: protein, 44.8 mg.; sugar, 86.4 mg., and chlorides, 780 mg., per hundred cubic centimeters. The fluid was sterile on culture. Tests for syphilis gave negative results.

A roentgenogram of the chest showed patches of clouding and moderately dense shadows over both upper lung fields. The diagnosis was bilateral chronic minimal pulmonary tuberculosis. A roentgenogram of the skull revealed a mild degree of increased digital markings over both parieto-occipital areas. The dorsum sellae of the sella turcica was almost completely destroyed, and thinning of its floor was also noted.

Ventriculographic investigation was performed on November 15. The left lateral ventricle was not located even after several taps in different directions; the right one, however, was entered without difficulty. The roentgen films showed both lateral ventricles partially filled with air but not dilated. The whole ventricular system was displaced toward the right The observations suggested the presence of a space-occupying lesion in the left temporal lobe; therefore an exploratory craniotomy was immediately performed.

A fair-sized osteoperiosteal flap was turned over the left temporoparietal region. The intracranial contents were under high tension No induration, however, could be detected on palpation. Exploratory punctures with a ventricular needle in different directions, even up to a depth of 7 cm., did not reveal any abnormal resistance. The brain tissue there was edematous, unusually soft and light lemon yellow. About 30 Gm. of it was removed. Since no definite tumor could be detected, the impression was that it would be wise to leave considerable decompression over that region. The wound, therefore, was closed without the bone flap.

Pathologic examination of the removed brain tissue revealed that, except for marked bleeding within the tissue itself, there was no noteworthy pathologic change. A parasitic ovum, however, was embedded in the tissue in one of the sections. The ovum appeared alive, with an operculum and a distinct shell. It measured about 0.07 by 0.05 mm. and was typical of a Paragonimus ovum.

The patient's reaction to the operation was not remarkable. His temperature, pulse rate and blood pressure returned to the normal level on the fifth postoperative day, but he remained in a semicomatose state. He was then given two courses of emetine treatment. A

daily dose of 60 mg. of emetine-HCl was administered intramuscularly. Each course lasted for ten days, with an interval of ten days between. The patient responded fairly well for a while. Mentally he became clearer, but he was now observed to be aphasic. He still had urinary and fecal incontinence. At the end of December he became delirious and had daily convulsions. Although he was drained intraspinally every day, the intracranial pressure remained high and was above 300 mm. of water as measured by lumbar punctures. He eventually died of his illness sixty-two days after the operation. Autopsy was not permitted.

Comment.—In this case we found only 1 ovum in all the sections of the removed tissue. In our opinion, nevertheless, the diagnosis of cerebral paragonimiasis is quite certain. The slide was examined by several pathologists, and they all agreed that the ovum was that of Paragonimus. It is our conviction that during the operation we did not actually reach the focus of disease. During these exploratory punctures, however, the ventricular needle must have penetrated such areas, and the ovum observed was carried by the needle into the brain tissue.

CASE 2.—L. Y., an 18-year-old Chinese soldier, was first admitted to the First General Hospital on Sept. 7, 1954, for repeated attacks of generalized tonic convulsions for one year and blindness of the right eye of six months' duration. The patient stated that in August 1953 he began to have left frontal headaches, sometimes accompanied by nausea and vomiting. Two months prior to admission he had the first attack of generalized tonic convulsions, together with loss of consciousness. Since then, he had had such attacks every two or three months. In March 1954, after a similar attack, the right eye became completely blind and the vision of the left eye much blurred. He noticed impairment of memory, and his speech became sluggish.

Physical examination on admission revealed the patient to be well developed and fairly well nourished. The right eye was completely blind, and vision in the left eye was limited to counting fingers. Examination of the fundi revealed secondary optic atrophy on the right and choked disc (4-5 diopters) on the left. It was observed that the patient's speech was slow and somewhat disarticulated.

Laboratory examination revealed that the blood, the urine and the stools were all normal. Lumbar puncture showed clear cerebrospinal fluid with a pressure of 270 mm. of water. There were 0-4 leukocytes per cubic millimeter of fluid. Other values were as follows: protein, 19 mg.; sugar, 78.4 mg., and chlorides, 743 mg. per hundred cubic centimeters. Cultures and other serological tests all gave negative results.

A roentgenogram of the skull showed widening of the suture lines and a generalized increase of digital markings.

Ventriculographic examination was performed with the aid of endotracheal ether anesthesia on September 20. The films showed a shifting of the anterior portion of the left lateral ventricle, and also of the third ventricle, toward the right. This suggested the presence of a space-occupying lesion in the left frontal lobe; therefore, a left frontal craniotomy was immediately performed.

A fair-sized osteoperiosteal flap was turned over the left frontal region. The dura was tense, and the brain underneath was edematous and pale. Exploratory punctures with a ventricular needle encountered no abnormal resistance. Exploration of the anterior fossa revealed no tumor. About 50 Gm. of the edematous brain tissue was removed. The wound was then closed without the bone flap, to provide decompression.

The postoperative course was uneventful. Pathologic examination of the removed brain tissue revealed no abnormality. The patient's headache was much relieved after the operation, but his eyesight remained unchanged. He was discharged from the hospital a month later.

After discharge, the patient still had convulsions from time to time. They could not be controlled with the usual anticonvulsants. He was therefore readmitted on March 26, 1955, for further investigation.

Physical examination on the second admission revealed the patient to be in good physical condition and mentally clear. A large decompression defect was noticed over the left frontal region. It was not tense on palpation. The right eye was blind, and the left one still could not go beyond counting fingers. Examination of the fundi revealed secondary optic atrophy on both sides. The patient's speech remained sluggish. No other abnormality was observed on neurologic examination.

Laboratory examination showed 4,800,000

erythrocytes and 7,800 leukocytes per cubic millimeter of blood with a differential count of 64 per cent neutrophils, 32 per cent lymphocytes, 3 per cent monocytes and 1 per cent eosinophils. The urine, the stool and the sputum were all normal. Lumbar puncture revealed blood-tinged cerebrospinal fluid (puncture trauma) with a pressure of 140 mm. of water. There were 545 erythrocytes per cubic millimeter. Other values were as follows: protein, 26 mg.; sugar, 88.8 mg., and chlorides, 730 mg., per hundred cubic centimeters. Cultures and other serologic tests all gave negative results. A roentgenogram of the chest showed the lungs to be essentially clear. Ventriculographic investigation was repeated on April 11. The films showed generalized dilatation of the entire ventricular system. The rightward shift of the anterior portion of the left lateral ventricle, however, as shown by the previous ventriculographic study, was no longer present. Instead, there was forward displacement of the occipital horn and the antrum of the left lateral ventricle. This suggested the presence of a pathologic condition in the left occipital lobe.

Exploratory craniotomy, with the patient under endotracheal ether anesthesia, was performed on April 25. A large osteoperiosteal flap was turned over the left occipital region. The dura was adherent to the underlying brain. The cortex there was light yellow. On palpation, an indurated mass was felt directly underneath. The cortex was then incised. The mass was found composed of a group of irregular nodules of varying size. It was greyish white and had a well-defined capsule. During removal some of the nodules were ruptured, resulting in a leakage of greyish white cheesy material.

They were removed in three groups. When these pieces were put together, the mass measured about 7 cm. across (Fig. 1A). After hemostasis had been secured, the wound was closed in layers.

The patient had an uneventful postoperative course. He had an attack of tonic convulsions on the eighth postoperative day. From then on he made steady improvement. His speech improved a great deal; his eyesight, however, remained unchanged.

Pathologic examination of the surgical specimen showed it to be composed of inflammatory tissue, with many thick-walled abscesses containing greenish yellow pus, the largest being about 1.5 cm. in diameter. Numerous fine furrows were seen extending in all

Fig. 1 (*Case 2*).—*A*, photograph of surgical specimen, showing masses composed of confluent nodules of varying size. Most of them were abscesses containing thick puslike material. *B*, ...granulomas. (High ...oxylin-eosin stain.) ...va were surrounded ... infiltration of all types of inflammatory cells.

directions. They represented the tracts created by the migration of the parasitic worms within the brain tissue. On careful search, however, no worm, living or dead, was found. The microscopic sections showed that within the walls of the abscesses and also of the furrows there were countless Paragonimus ova. Most of them appeared dead, as they were surrounded by multinuclear giant cells and epitheloid cells forming pseudotubercles. There was also heavy infiltration of lymphocytes, plasma cells and eosinophils. A few Charcot-Leyden crystals were also observed. The fibrous reaction in the tissue was rather extensive (Fig. 1*B*).

CASE 3.—C. C., a Chinese woman 40 years of age, visited the Outpatient Department of the Center Clinic on Aug. 31, 1955, stating that she had had repeated attacks of generalized convulsions for six months. She said that

she had eaten river crabs not well cooked in April 1947. About 5 months later an attack of irregular fever developed, with a daily chill, a productive cough and hemoptysis. A diagnosis of pulmonary paragonimiasis was made and proved at the Taipeh Provincial Hospital, and she was treated with daily injections of emetine hydrochloride for three months. The symptoms then gradually subsided, and two months later she was well.

In 1949 she began to have convulsions of the grand mal type every one to three months. These episodes were always preceded by an aura of dizziness and a flashing of light in her eyes. She then noticed general malaise and frequent attacks of headaches and dizziness.

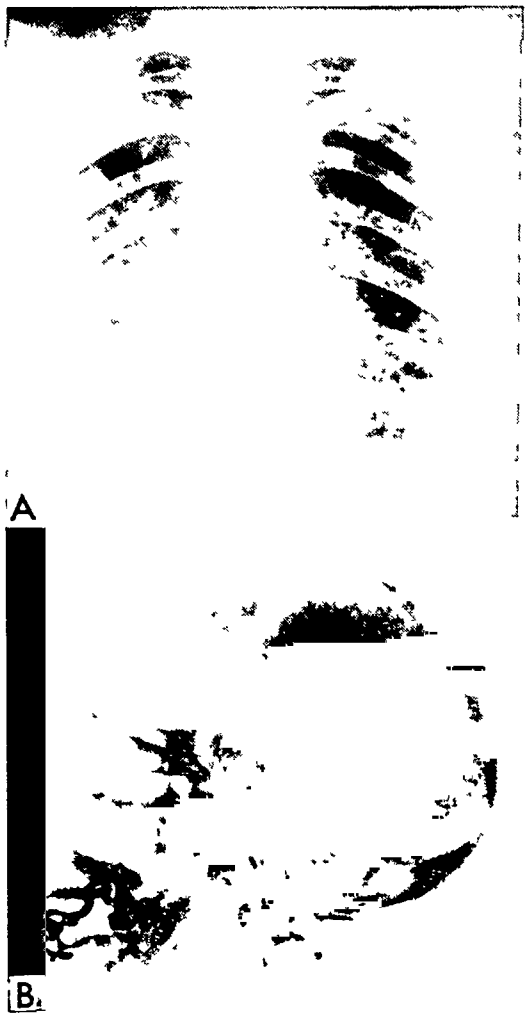

Fig. 2 (*Case 8*). — *A*, thoracic roentgenogram showing patches of clouding in the left basal lung field. Both hilar shadows were heavy. *B*, roentgenograms of the skull, lateral view. The calcified pineal gland was clearly visible. Behind it, in the right occipital region, was a round shadow of faint calcification.

Physical examination in the outpatient department revealed her to be well developed and well nourished. Except for complete right homonymous hemianopia, there was no abnormality.

Laboratory examination revealed an erythrocyte count of 7,160,000 and a leukocyte count of 8,500 per cubic millimeter of blood, with 62 per cent neutrophils, 35 per cent lymphocytes, 2 per cent monocytes and 1 per cent eosinophils. The urine and the stool were normal. No parasitic ovum was detected in the sputum. The blood sedimentation rate was 18 mm. for the first hour.

A roentgenogram of the chest showed *patches of clouding in the left basal lung field*, almost obliterating the costophrenic angle. The hilar shadows were heavy and lung markings were exaggerated over both sides (Fig. 2*A*). These signs favored the diagnosis of pulmonary paragonimiasis. Plain films of the skull showed calcification of the pineal gland, which was in the normal position. A round shadow of faint calcification about 4 cm. in diameter was visible in the right occipital region (Fig. 2*B*).

The patient apparently had a cerebral involvement of the parasitic disease. Judging from her clinical course and the roentgen observations, the cerebral focus was long-standing but was not progressing. There was no clinical symptom, sign or evidence of intracranial hypertension. Exploration and an attempt at removal, therefore, were not considered justified. She was therefore treated with anticonvulsive medication (luminal, 0.09 Gm. and sodium dilantin 0.3 Gm. daily). The headaches and dizziness disappeared, and she has remained free from convulsions for the past six months.

GENERAL COMMENT

Route of Invasion of the Brain.—The route by which the Paragonimus parasites invade the brain has not yet been definitely ascertained. Yokogawa, Suemori and Murai[5] postulated that, during the migration of the parasites from the intestine to their destinations, some of them may bypass the lung and wander into the soft tissue of the neck. From there these parasites may proceed forward along the in-

ternal jugular vein and eventually penetrate into the cranium through the jugular foramen They then migrate further along the course of the transverse sinus, perforate the brain membranes there and invade the temporal or the occipital lobe Yokogawa also suggested that they may invade the intracranial contents through the orbit It was assumed that after they enter the neck they may follow the course of the external carotid artery and the internal maxillary artery, or that of the facial vein and the ramifications of the pterygoid plexus They then enter the cranium through the orbital fissures In 1 of the cases reported by Chung and his coworkers[4c] there was a definite history of swelling of soft tissue around the right orbit and exophthalmos of the right eye lasting for six months prior to the onset of intracranial involvement These symptoms had been considered by the authors as evidence that the parasites may take the orbital route of invasion

The Paragonimus parasites must pass through the foramens of the skull in order to penetrate into the enclosed bony cranium In our opinion they have no preference for any particular foramen and therefore may enter any one with which they come into contact These parasites like, however, to take the course of least resistance The vascular bundles in the neck outline the most convenient pathways for them to travel The internal jugular vein, being the largest vessel and having a nearly straightforward course, offers a most desirable track Hence, we agree with Yokogawa that in most cases of cerebral paragonimiasis the parasites probably invade the brain in the manner he described

Cerebral Pathologic Change Resulting from Invasion of Parasites — When the parasites penetrate into the brain tissue, they find that their new environment is not at all favorable In the lung they can fulfil their destiny by propagating their species, laying their eggs in the wall of the bronchial tree These eggs will be discharged into the lumen of the bronchus and coughed out in the sputum Unlike the lung, the brain has no exit to the outside world Therefore, they travel back and forth in the vast mass of brain tissue, trying hopelessly to find a suitable place to deposit their eggs Since no such place can be found, they have to lay eggs anywhere they happen to be, in the walls of the furrows they have created, in the brain tissue where they rest, until the final days of their lives

Fortunately, the number of parasites that get into the brain, in any instance, must be small In the majority of cases there is probably only a single parasite Furthermore, it seems likely that these parasites have a relatively short period of survival in brain tissue The active destructive process, therefore, does not operate for a long time As the invading parasites die out, repair and walling off processes take place The damaged areas are transformed into encapsulated granulomas, with necrotic brain tissue and yellowish green puslike material in the center

The Paragonimus granulomas, like those of other pyogenic origins, have a tendency toward spontaneous healing Should all conditions be favorable for the encirclement of the disease, the lesions may be transformed into a relatively quiescent focus in the brain As time goes on they may also undergo calcification

Distribution of Granulomas in the Brain — Although, as has been stated, there is probably only a single invader in most instances, the brain lesions produced by the parasite are often multiple In the 2 autopsies reported by Chung and his associates,[4c] multiple foci involved both hemispheres The operative cases reported by Hooper[4b] and Kim[4d] also re led mul-

tiple cysts or granulomas in conglomeration. Our own second patient, too, had several granulomas in the occipital lobe. The fact can be well explained if one assumes that most granulomas result from destruction of brain tissue and irritation of the ova during the parasites' migration; therefore, when there are clinical signs of definite localization, the patient may have, in other parts of the brain, many more small foci which can be recognized only by careful postmortem pathologic examination.

Most of the granulomas are located in the white matter of the hemispheres. When they become large enough they may extend toward the surface of the cortex or deep into the interior, approaching the wall of the ventricle and involving the basal ganglia. They are distributed rather evenly in the different lobes of the brain. From reports of 34 autopsies in the literature, Lin[6] noted that granulomas were situated in the frontal lobe in 18 instances, in the parietal lobe in 12, in the temporal lobe in 18 and in the occipital lobe in 19. The right side was more frequently involved than was the left. The exact ratio in Lin's series was 37:29. In 3 of the 4 operative cases reported by Kim,[4d] granulomas were observed in the parietotemporal region. In 2 of our patients the lesions were in the occipital lobe. Since we consider the temporal and occipital lobes more easily accessible to the parasites, we consider also that even this slight preponderance in the frequency of involvement of these lobes cannot be regarded as entirely insignificant.

Clinical Course.—The clinical course of cerebral paragonimiasis, according to the pathologic changes in the brain, can be divided into three stages: acute inflammation, intracranial hypertension and chronic irritation. In the early days of parasitic penetration into the brain, only symptoms of mild cerebral irritation are produced. When the parasites begin to ramble about in the brain, lay their eggs and begin to damage more brain substance, then symptoms and signs of more extensive cerebral inflammation appear. Patients may then show all the manifestations of meningeal irritation. The headache and dizziness become more severe and constant. Rigidity of the neck and Kernig's sign become evident. Irregular fever develops; general malaise, impairment of appetite and loss of body weight all set in. Depending upon the extent of the brain lesion, the mentality may be clouded, even to the extent of complete loss of consciousness. At times, convulsions of various types may supervene. The intracranial pressure gradually increases as more areas of brain become involved. Should the process of brain destruction proceed too far, the patient may die, with all the symptoms and signs of an acute cerebral infection.

The parasites, in all probability, are active for a short period only. The destruction they produce, however, needs a considerable time for the body to overcome. The damaged tissue is gradually liquefied and absorbed. At this time there is a heavy infiltration of inflammatory cells and Charcot-Leyden crystals in the tissue. As the areas begin to be surrounded by fibrous tissue, the lesions are gradually converted into encapsulated granulomas. At this stage of the disease the patient presents all the symptoms and signs of intracranial hypertension, as well as the signs of focal involvement of the brain. Choking of the optic discs is rather common. Impairment of vision and hemianopia may appear if the occipital or temporal lobe is extensively destroyed. There may also be ptosis, nystagmus and facial paresis. Various kinds of aphasias may appear if the speech centers are involved. Monoplegia or hemiplegia is rather common, as the internal capsule is frequently involved. The patient usually has convulsive seiz-

ures, especially of the Jacksonian type.

If the intracranial pressure is not elevated to a dangerous degree or for an intolerable period, the host will be able to wall off these granulomas. The inflammatory reaction of the surrounding brain tissue slowly subsides, and the elevated intracranial pressure gradually returns to its normal level. The symptoms, likewise, show a considerable degree of improvement, except for those which result from irreparable damage to the brain structures. These inert foci will remain rather quietly in the midst of the brain and from time to time will act as foci of chronic irritation or epileptic attacks.

Our experience is in contradiction to the usual theory that once the parasites invade the brain, if they are not surgically extirpated, the patient will die. Our third patient, whose brain had been involved for more than six years, with the lesion apparently well encapsulated and partially calcified, is enjoying her life comfortably at the time of writing, with only occasional convulsive seizures.

Diagnosis.—Paragonimiasis is a disease that exists only in certain geographical regions. One need not include it in the differential diagnosis, therefore, if he is not in these endemic areas. Thus far there has been no report of cerebral paragonimiasis occurring in nationals other than Chinese, Japanese, Philippine and Korean. In the only case reported from Australia (by Hooper[4b]) the patient was Chinese. He was a seaman and had contracted the disease in China. As large numbers of American and European troops have been sent to and stationed in Japan, Korea and Formosa in these recent years, however, it will be no surprise to find some of them infested by this parasite. Actually, pulmonary paragonimiasis was reported to have been contracted by American Marines during World War II.[7]

The history of having eaten raw or ill-cooked crabs is an important lead and should arouse one's suspicion. The Paragonimus parasites, before infesting a human being, have their cercariae encysted in fresh water crabs. Only by eating these infested crabs can human beings contract this disease.

Involvement of the lung, which is the most frequent site of this parasitic infestation, usually gives rise to irregular fever, chronic cough and expectoration of bloody sputum. The clinical picture is difficult to differentiate from that of chronic bronchitis or pulmonary tuberculosis. Paragonimus parasites also produce mottling shadows and cloudiness on roentgen plates of the lung. These shadows are often indistinguishable from those of tuberculosis, except they tend to involve the lower parts of the lung fields. Nevertheless, patients suffering from paragonimiasis, like those with other parasitic diseases, usually have quite prominent eosinophilia, particularly during the acute stage of the disease. The presence of eosinophilia in the peripheral blood, therefore, is a strong indication that such infestation is present. The correct diagnosis can usually be made when one discovers the typical ova in the sputum.

The recognition of cerebral involvement in a patient who is known to be infested by Paragonimus should not be difficult. When, in such a patient, symptoms of cerebral irritation or inflammation develop, one should strongly suspect that the parasites have penetrated into the brain. In the course of time, if manifestations of intracranial hypertension or symptoms and signs of a space-occupying lesion appear, the diagnosis of parasitic localization in the brain is almost certain.

It is difficult, however, to determine the correct nature of cerebral lesions in a patient without a history of pulmonary involvement, especially when he is first seen during the chronic stage of the disease,

his pulmonary lesions already well healed, his peripheral blood no longer revealing eosinophilia and his sputum no longer containing parasitic ova. In the case of such a patient, the correct diagnosis can be established only after operative exploration and examination of the surgical specimens.

Busch and Cooper[4a] stated that such parasitic involvement of the brain often produces a peculiar yellowish discoloration of the exposed cortex. Hooper[4b] had the same impression. In the 2 patients upon whom we operated we noticed this color. It is probable, therefore, that this yellowish discoloration of the brain may be helpful in recognizing the correct nature of the lesion during exploration.

Treatment.—Thus far there is no known effective helminthicide for the treatment of paragonimiasis. Kobayashi and Ando[8] advocated the use of emetine hydrochloride, which, according to these authors, lessens the sexual activity of the trematodes, causing them to produce fewer ova and accomplish less tissue destruction. For effective improvement they recommended a relatively heavy dose, i.e., 1.25 cc. of a 2 per cent solution, given intramuscularly 4 times daily for five successive days. Since the drug has an injurious effect on the cardiac musculature, its use should be discontinued as soon as bradycardia or a fall in blood pressure is noted. Bercovitz[9] suggested more cautiously, that 1 gr. of emetine hydrochloride be given daily for seven successive days. Yokogawa, Ro, Wakisaka and So,[10] in 1940, observed that sulfanilamide (prontosil) has a beneficial action in cases of this disease, especially when administered in combination with emetine hydrochloride. In the cases of 9 patients with pulmonary paragonimiasis so treated by them, the infestation was successfully controlled in at least 4.

With regard to cerebral paragonimiasis, it is our opinion that this chemotherapeutic measure may be worth trying in the acute stage. Our first patient, who was given two courses of such treatment, responded for a brief period, as was evidenced by the brightening of his mental status, although he eventually died of the disease. We are convinced that the emetine hydrochloride will exert vermicidal action upon the parasites, provided they are still alive; hence, it will suppress the parasites' activities and favor the process of localization. This kind of treatment is recommended for patients in whose cases, although the diagnosis is verified by operation, the lesions cannot be completely excised because they are too acute, too extensive or inaccessible. It is also advisable to give a course of such treatment postoperatively when living worms or ova are discovered in the removed specimens.

It is difficult to obtain a successful outcome if the operation is performed in the early stage of cerebral involvement. At that time the parasite is still wandering in the cerebral tissue, and edema and inflammation are widely distributed. Localization of the lesion is often inaccurate, and surgical extirpation is frequently impossible. In dealing with the mounting intracranial tension, we recommend a combination of chemotherapeutic treatment and decompressive measures (either subtemporal decompression or daily spinal drainage). In due time, the process will probably be localized, and the cerebral swelling and the intracranial tension will gradually subside.

When the lesion begins to be transformed into a definite granuloma, surgical intervention will bring about the most substantial result. Ventriculographic and cerebral angiographic studies should be employed to obtain the exact localization. Complete surgical excision can usually be accomplished at this time.

When the situation is favorable, so that the cerebral lesion undergoes spontaneous

calcification, the proper management of the patient will depend upon the extent of the symptoms produced by these inert foci in the brain. We consider it well justified to handle such a patient conservatively if he suffers only from convulsive disorders; at the same time, the convulsions can be well taken care of by the ordinary anticonvulsive measures. In all probability the foci in such cases will gradually lose *their alertness and significance in initiating* the symptom complex.

SUMMARY

Paragonimiasis is a parasitic disease that exists endemically in Japan, Korea, China (Formosa) and the Philippines. Cerebral localization of this parasitic infestation is not infrequent. Its clinical course can be divided into a stage of cerebral inflammation, a stage of intracranial hypertension and a stage of chronic cerebral irritation. The history of having eaten infested, parasite-carrying, fresh water crabs and the presence of typical ova in the sputum are important leads in arriving at a correct diagnosis. Surgical treatment is profitable only when the lesions in the brain have transformed into localized granulomas.

A detailed report of 3 cases is also included.

RIASSUNTO

La paragonimiasi è una malattia parassitaria endemica nel Giappone, in Corea, in Cina (Formosa) e nelle Filippine. La localizzazione cerebrale del parassita non è rara. Il suo quadro clinico può essere distinto in tre stadi: infiammazione cerebrale, ipertensione intracranica, irritazione cerebrale cronica. Per giungere ad una diagnosi corretta è necessario che nella anamnesi figuri la ingestione di gamberi di acqua dolce, vettori del parassita, e che vi siano nello sputo le caratteristiche uova. La cura chirurgica è utile solo quando le lesioni cerebrali sono del tipo del granuloma localizzato. Vengono riferiti per esteso 3 casi.

RÉSUMÉ

La distomiase pulmonaire est une affection parasitaire qui existe à l'état endémique au Japon, en Corée, en Chine (Formose) et aux Philippines. La localisation cérébrale de cette affection n'est pas rare. Son évolution clinique peut être divisée en un stade d'inflammation cérébrale, un stade d'hypertension intracranienne, et un stade d'irritation cérébrale chronique. Le fait d'avoir mangé des crabes d'eau douce infestés, porteurs de parasites, et la présence d'oeufs typiques dans les crachats sont des indices importants pour un diagnostic correct. Le traitement chirurgical n'est efficace que lorsque les lésions cérébrales se sont transformées en granulomes localisés.

Une étude détaillée de trois cas est inclue dans ce rapport.

SUMARIO

A paragonimiase é uma doença parasítica que existe endemicamente no Japão, Coreia, China (Formosa) e nas Filipinas. A localização desta infestação parasítica não é infrequente. Seu curso clínico pode ser dividido em um estágio de inflamação cerebral, um estágio de hipertensão intracranial e um estágio de irritação cerebral crônica. A história de se ter comido hortaliças de água fresca infestada e portadoea de parasita e a presença de ovas típicas no escarro são dados importantes para se chegar a um diagnástico correto. O tratamento cirúrgico é aprovcitável apenas quando as lesões no cérebro tenham se transformado em granulomas localizados.

Um relatório detalhado de 3 casos está incluido.

ZUSAMMENFASSUNG

Die Paragonimiasis ist eine parasitäre Erkrankung, die in Japan, Korea, China (Formosa) und in den Philippinen endemisch besteht. Das Gehirn ist nicht selten befallen. Der klinische Verlauf lässt sich in ein Stadium der Gehirnentzündung, in eines der intrakraniellen Druckerhöhung und in eines der chronischen Gehirnreizung einteilen. Zur Stellung der Diagnose bilden die Anamnese des Verzehrens von Süsswasserkrebsen, die von den Parasiten befallen sind, und der Nachweis der typischen Eier im Auswurf wichtige Hinweise. Die chirurgische Behandlung ist nur dann von Nutzen, wenn die Veränderungen im Gehirn sich in umgrenzte Granulome verwandelt haben.

Die Arbeit enthält einen ausführlichen Bericht über drei Krankheitsfälle.

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Our ancestors were a nostrum-loving race from the king to the cottager, and the history of panaceas and specifics would form a large volume of humiliating memorials, of the credulity of the public that would swallow them, and the infatuation of the physician who could prescribe them. Who could believe that a philosopher would eat two hundred pounds of soap?—a bishop drink a butt of tar-water? or that in a course of chemical neutralization, Meyer should swallow twelve hundred pounds weight of crab's eyes . . . In German *Ephemerides*, the case of a person is described, who had taken so much Elixir of Vitriol, that his keys were rusted in his pocket by the transudation of the acid through the skin, and another patient is said to have taken Argentum Nitratum, in solution, until he became blue.

—*William Wadd*, circa *1827*

Severe Abruptio Placentae

A Study of Eighty-two Cases

LEWIS B. POSNER, M.D., A.I.C.S., GEORGE D. ANDERSON, M.D., AND A. CHARLES POSNER, M.D., F.A.C.S., F.I.C.S., D.A.B.

NEW YORK CITY, NEW YORK

SEVERE abruptio placentae is an urgent obstetric emergency for which definitive treatment should be started immediately and completed, if possible, within four hours. Its incidence varies from 1 in 85 to 1 in 244, since many authors group together all cases of premature separation, whether mild, moderate or severe. If we were to consider all of our 125 cases of pain with bleeding during the last trimester of pregnancy our incidence of abruptio placentae would be 1 in 207.

This study, however, is restricted to 82 cases of severe abruptio placentae occurring in 25,977 deliveries in the Obstetrics Service of the Harlem Hospital, New York, from Oct. 1, 1949 to Oct. 1, 1955. Our incidence for severe abruptio placentae, therefore, was 1 in 316.

The criteria for severity are: (1) pain, which ranges from moderate to excruciating; (2) hemorrhage, which is always profuse internally but may be minimal externally; (3) irritability or tetany of the uterus; (4) fetal distress or death; (5) impending or actual shock; (6) hypofibrinogenemia, and (7) occasionally acute renal failure. The first four are fairly constant; the fifth and sixth may follow if treatment is not instituted quickly.

The most constant symptom of severe abruptio placentae, in our experience, is sudden, often excruciating pain occurring in the last trimester of pregnancy. External bleeding is frequently minimal and sometimes absent. The uterus is tender, irritable and often tetanic. Fetal death is common. A retroplacental clot, with a crater in the maternal surface of the placenta, is a uniform observation. In a large municipal institution like the Harlem Hospital, which serves a geographically limited but densely populated area, patients are often admitted within minutes of the onset of their illness. Our symptom sequence may therefore differ from those recorded in hospitals whose patients come from a distance.

The features of this clinical entity are listed in Table 1, in the order of frequency encountered in our series.

An analysis of our 82 cases follows:

Age.—Our youngest patient was 15 years old, our oldest 40. The average age was 27.3 years. Age apparently was not a factor, since the age range in this series did not differ significantly from the ages of the rest of our obstetrical population.

Gravidity.—Seventy-two (87 per cent) of the patients were gravidae 2 or more. Ten (12 per cent) were gravidae 1. Severe abruptio placentae appears to be

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more frequent in multigravid women.

Parity.—Fourteen (17.1 per cent) of our patients were primiparae and 68 (82.9 per cent) were multiparae. This differs from the figures of Douglas and his associates,[1] who reported 46.6 per cent primiparae and 52 per cent multiparae.

Multiple Gestation.—There were 2 cases (2.4 per cent) of twin pregnancy. In both of these there was evidence of severe toxemia. In 1 of the patients hypofibrinogenemia developed and was followed by acute renal failure (Fig. 1).

Race.—The percentage of Negroes admitted to the Obstetrics Service of the Harlem Hospital is invariably high. In this study 96 per cent of our patients were Negro; only 4 per cent were white or Puerto Rican. No case of severe abruptio placentae occurred in the white patients, which resulted in an incidence of 0.26 per cent for this emergency among Negro obstetric patients. One must however be wary of drawing conclusions from skewed samples.

Duration of Pregnancy.—From Table 2 it appears that none of the patients with severe abruptio placentae in our series went to full term. The greatest incidence occurred from the twenty-seventh to the thirty-eighth week of gestation. No cases of less than sixteen weeks' gestation are recorded, because such cases are treated by the gynecologic service.

Fetal Weight.—The largest infant in this series weighed 10 pounds and 7½ ounces (4,760 Gm.). Its mother was diabetic and had polyhydramnios. The smallest infant weighed 11½ ounces (320 Gm.). Its mother gave a history of only sixteen weeks' gestation, but on admission the uterus was found to be the size of 28 weeks. The average fetal weight was 5 pounds and 7 ounces (2,400 Gm.).

Maturity.—Only 27 infants were mature. Forty-two were premature, and the weights of 13 were not recorded. These were usually immature. This seems to coincide with the durations of pregnancy.

TABLE 1.—*Pathologic Signs Associated with Severe Abruptio Placentae, in Order of Frequency*

	No.	Per Cent
1. Pain	82	100
2. Retroplacental clot	82	100
3. Internal bleeding	82	100
4. External bleeding	68	82.9
5. Tetanic uterus	68	82.9
6. Absence of fetal parts	59	72.8
7. Absence of fetal heart tones	59	72.8
8. Hypertension and Proteinuria	37	45.1
9. Shock	28	34
10. Edema	24	29.7
11. Clotting defect	15	18.5
12. Hypertension without Proteinuria	12	14.6
13. Acute renal failure	5	6.2
14. Other renal impairment	3	3.6

TABLE 2.—*Duration of Pregnancy*

Weeks of Gestation	*No. of Cases*	*Per Cent*
16-26	4	4.9
27-32	27	32.9
33-36	27	32.9
37-38	23	28.0
Undetermined	1	1.3
Term	0	0
Total	82	100

Couvelaire Uterus.—Nine cases of Couvelaire uterus were observed, an incidence of 10 per cent. All of the patients were given massive transfusions. Two were treated by hysterectomy in the days before fibrinogen was in use in our hospital. After fibrinogen became available, 1 patient was restored to normal clotting by the administration of 1.7 Gm. A typical example of the Couvelaire uterus is shown in Figure 2.

Methods of Delivery.—The methods of delivery were pelvic alone, pelvic preceded by pitocin, and cesarean section. These are analyzed in Table 3.

Fetal Mortality.—The fetal mortality rate was high, amounting to 75 per cent

of the 84 infants (there were 2 sets of twins).

Maternal Morbidity.—Morbidity, as evidenced by a temperature of 100.2 F. or higher for two or more days, was present in 34 (41.5 per cent) of the patients. Forty-eight patients (58.5 per cent) were afebrile. The average period of hospitalization for the febrile patient was eleven and eight-tenths days, while that of the afebrile patient was only five and nine-tenths days.

Maternal Mortality. — There were 3 deaths in our series, an incidence of 3.6 per cent. Two of these followed cesarean section, and 1 followed pelvic delivery.

Other Factors. — We have eliminated from this review a number of other factors, such as the Rh factor, syphilis and diabetes, which were found to have no statistical significance.

Etiologic Factors. — Severe abruptio placentae has been attributed to many factors, including trauma, previous uterine operations involving the placental site, pathologic conditions of the cord, toxemia, renal disease, vascular impairment and premature rupture of the membranes. Our study has not demonstrated any single etiologic factor as responsible for severe abruptio placentae.

Trauma: Only 1 patient in our series had a definite history of trauma. She was a 15-year-old girl, gravida 2, para 1, who sustained a severe fall four hours before admission. Thirty minutes before admission she had sudden excruciating abdominal pain without external bleeding. The uterus was tender and board-like on admission, with only a minimal amount of vaginal bleeding. There was no evidence of toxemia.

Previous Uterine Operations: In only 8 cases (10 per cent) had previous operations been performed on the uterus. Five of the patients had undergone previous cesarean sections; 2, dilation and curettage, and 1, cornual resection for ectopic pregnancy.

Pathologic Cord.—Pathologic change in the cord was not noted in our series. Either it was absent or it was considered of no significance.

Toxemia: Hypertension and proteinuria have been reported as present in 50 to 70 per cent of patients with some degree of abruptio placentae. We have observed them in 45.1 per cent of our cases. It does not necessarily follow, as O'Donel Browne[2] has pointed out, that the toxemia is the cause of the abruptio placentae. Concealed hemorrhage, regardless of the cause, may be a factor in producing proteinuria.

Renal Impairment. — Eight patients showed definite evidence of renal impairment, which was confirmed by the blood chemical values and other data. In 5 of these acute renal failure developed, for which they were treated. Four with acute renal failure survived, but 1, who was admitted to the hospital in coma, soon died. The diagnosis of acute renal failure in this patient was confirmed at the autopsy table, where lesions resembling the tubulorhexis described by Oliver, McDonnell and Tracy[3] were observed.

Proteinuria.—Thirty-seven patients (45.1 per cent) had proteinuria and hypertension on admission. Of these, 3 history of hypertension or r tein

TABLE 3.—*Method of Delivery and Associated Maternal and Fetal Mortality**

Method of Delivery	No. of Cases	Per Cent	Maternal Mortality No.	Maternal Mortality Per Cent	Fetal Mortality No	Fetal Mortality Per Cent
Pelvic	37	37 5	1	2.6	30	73.2
Pitocin, followed by pelvic delivery	20	24 4	0	0	12	60
Cesarean section	23	28.1	2	8.6	21	90.7
Total	82	100	3	3.6	63	75

*The fetal mortality rate is based upon 84 infants, since two sets of twins were delivered by the pelvic route.

had attended no prenatal clinic. Ten displayed normal prenatal courses. The remaining 24 had had proteinuria and hypertension while receiving prenatal care. Sixteen of the latter group were noted in the Clinic to have edema. From this we must conclude that we were able to diagnose the existence of true toxemia prior to the abruptio placentae in only 24 (29 per cent) of our 82 cases.

From our series we are inclined to agree with Browne that severe abruptio placentae *per se* may be one of the causes of hypertension and proteinuria, regardless of the cause of the abruptio itself. We have considered the possibility that in some of our cases the hypertension may have been an initial rise before the fall that occurs with shock, but we have no statistical proof of this.

Hypofibrinogenemia.—As early as 1901, De Lee[4] reported a hemorrhage tendency accompanying abruptio placentae. Dieckman,[5] in 1936, reported a decrease in fibrinogen in some cases. The present concept of this defect, called afibrinogenemia, appeared in 1953, after publication of the work of Reid, Weiner and Roby[6] at the Boston Lying-In Hospital. Afibrinogenemia implies complete depletion of circulating fibrinogen, which is rare. More frequently only a decrease in the total amount of circulating fibrinogen is apparent in these cases of continuing hemorrhage. Hypofibrinogenemia is therefore the usual diagnosis.

It has been suggested by Reid, Weiner and Roby[6] that a thromboplastin-like material from the retroplacental clot or necrotic decidua enters the maternal circulation and combines with all the available fibrinogen, initially producing intravascular clotting and subsequently a coagulation defect which is responsible for the hemorrhagic diathesis. It should be emphasized that afibrinogenemia appears only in cases of severe abruptio placentae.

From. Oct. 1, 1949, to Oct. 10, 1953, we observed 8 cases of abnormal hemorrhage and lack of clotting in patients with severe abruptio placentae, which in our present opinion were cases of hypofibrinogenemia. From Oct. 10, 1953, to Oct. 1, 1955, hypofibrinogenemia was definitely diagnosed in 7 more cases, making a total of 15 patients with hypofibrinogenemia, an incidence of 1 in 5.4.

The bleeding associated with hypofibrinogenemia is not from the placental site alone. We have observed nasal, rectal, conjunctival, gingival and cutaneous hemorrhages. Venipuncture or even palpation of the skin may be followed by local hemorrhage. Some of these sites are shown in Figure 3.

The diagnosis of hypofibrinogenemia is made by (1) the observation of nonclotting hemorrhage, (2) an abnormally long clotting time by clot observation test, (3) dissolution of the clot after one hour at room temperature and (4) a blood fibrinogen level below 111 mg. per hundred cubic centimeters.

Pathologic Picture. — Hertig[7] described severe abruptio placentae when due to toxemia as acute degenerative arteriolitis that occurs at the placental site. He attributed nontoxic separations to a senile degenerative status. Profuse bleeding is present but may be entirely concealed, at least at the onset. Greenhill[8] stated that the escaping blood "pursues one of four courses: First, and most rarely, it may distend the uterine wall toward the abdominal cavity and encroach on the cavity of the ovum, the edges of the placenta remaining attached to the uterus. Second, it may dissect all the membranes around it severing almost all the connections of the ovum. Third, it may break into the amniotic fluid. Fourth, it may seek a direct passage outward from the edge of the placenta under the membranes through the cervix into the vagina." We have ob-

Fig. 1—Photograph taken in a case of severe abruptio placentae occurring in twin pregnancy. Note placenta with crater formation.

served all four pathways.

Retroplacental clot and placental crater were observed grossly in every one of our 82 cases. The clots ranged from moderate-sized to massive. They were present at various aspects of the maternal surface of the placenta, seldom centrally located, and usually associated with sclerotic changes on the maternal surface. Unfortunately, in the 1 case of abruptio placentae attributed to trauma no description of the placenta was recorded beyond the statement that a retroplacental hematoma was present. Figure 4 shows a placenta with the characteristic crater.

Management.—Because severe abruptio placentae is associated with great pain, profuse concealed hemorrhage and rapid intrauterine fetal death, and may soon be followed by shock, clotting defects and even maternal death, we do not believe in temporizing. Management is directed toward (1) hemorrhage and hypofibrinogenemia; (2) impending or actual shock and (3) the emptying of the uterus.

Initial Steps.—As soon as a patient with severe abruptio placentae is admitted to the Obstetrics Service of the Harlem Hospital, the chief resident obstetrician and the attending obstetrician on duty are notified. Blood samples are drawn for typing, Rh factor, crossmatching, blood chemical tests and clot observation. The clot observation test is repeated at intervals of thirty minutes until normal clotting is resumed or delivery completed. It is then repeated hourly until four hours after delivery. A continuous infusion of 5 per cent dextrose in saline solution through an 18-gauge needle is used to keep a vein patent. Blood pressure and fetal heart heart tones, if present, are recorded and observed at fifteen-minute intervals. A catheterized urine specimen is taken and examined for albumin.

Hemorrhage and Hypofibrinogenemia.—If hypofibrinogenemia is present or is in the process of developing, fibrinogen in

Fig. 2.—Drawing of a typical example of the Couvelaire uterus.

an amount sufficient to restore normal clotting is administered in 200 cc. of distilled water. The initial dose of fibrinogen is about 1.7 Gm. Transfusion of properly crossmatched whole blood should be administered as rapidly as is necessary. It must be remembered that whole blood alone is not sufficient in the treatment of developing hypofibrinogenemia, since bank blood has a lower level of fibrinogen than has normal circulating blood. We attempt to maintain a supply of 10 Gm. of fibrinogen on the delivery floor at all times.

Shock.—Shock is treated by the administration of morphine sulfate .016 mg. on admission, repeated when necessary. It is further treated by replacement of fibrinogen and blood. If there is any delay in obtaining properly crossmatched blood, *type O, Rh-negative blood, modified by* Witebsky substance, is given temporarily.

Emptying the Uterus.—While these procedures are going on, the operating room is prepared for any emergency that may occur. A sterile vaginal examination is performed as soon as possible. If the membranes are unruptured, they should be ruptured at this time. Intrauterine pressure is thus relieved, and the chances of forcible entrance of more thromboplastin into the maternal circulation are diminished.

If shock and hypofibrinogenemia, if any, have been corrected, rapid spontaneous

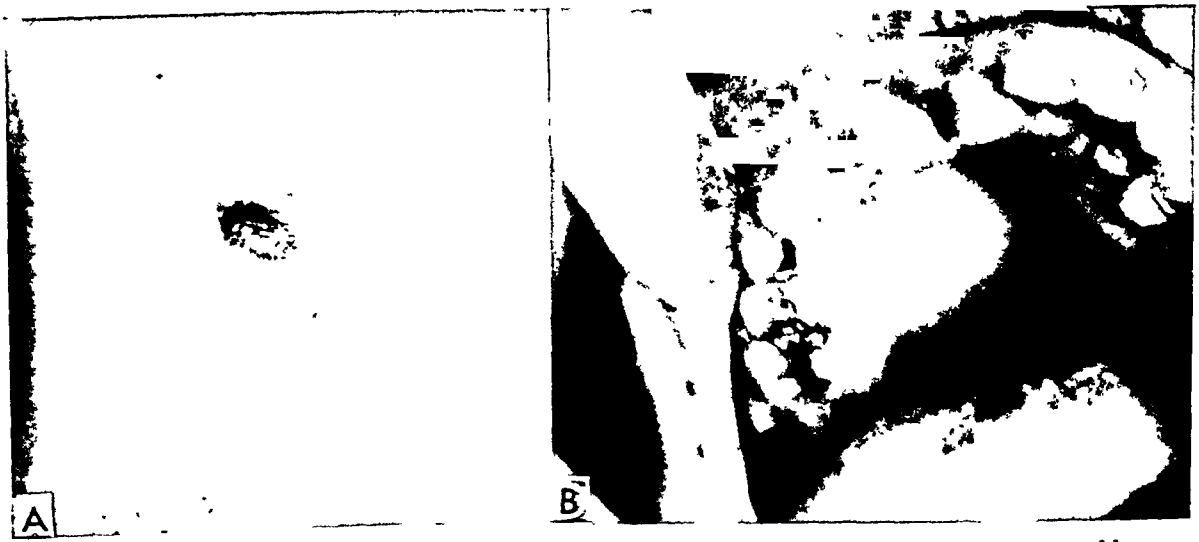

Fig. 3.—Bleeding (*a*) at site of venipuncture and (*b*) from gingiva in a woman 23 years old, gravida 1, para 0, with severe abruptio placentae and hypofibrinogenemia.

labor will often follow rupture of the bag of waters. If the cervix is effaced and dilation equals 4 cm. or more, the labor will usually progress rapidly. If the cervix is effaced but dilated only slightly, the employment of pitocin infusion, after correction of clotting defect and blood replacement, in our experience seems to offer the best chances for a live mother and a live baby. This was evident in our series even though we were aware of Reid's observation that pitocin infusion may force more thromboplastin-like substances into the maternal venous sinuses, thus further depleting the amount of fibrinogen in the maternal circulating blood. It must be stated, however, that fetal heart tones were present in a larger number of patients delivered with the aid of pitocin infusion than in those who were delivered spontaneously or by cesarean section. Labor may not ensue, especially if the cervix is long, closed and hard. After clotting defect, hemorrhage and shock have been treated, we do not countenance any further delay. If there is a possibility of fetal salvage in these cases, a cesarean section, usually of the low flap type, is then performed. Even if fetal heart tones are absent, we may perform a cesarean section on a patient with severe abruptio placentae if labor does not progress and delivery does not occur within four hours.

In our opinion, once the hemorrhage, clotting defect and shock have been treated, further delay may only permit the vicious process to continue. Hypofibrinogenemia may occur at any stage, even after the placenta has been removed. Only recently we observed a case in which the fibrinogen level dropped and epistaxis occurred just as we were suturing the fascia after having completed a cesarean section for severe abruptio placentae.

Since fibrinogen has been available at our institution, hysterectomy for Couvelaire uterus has been unnecessary.

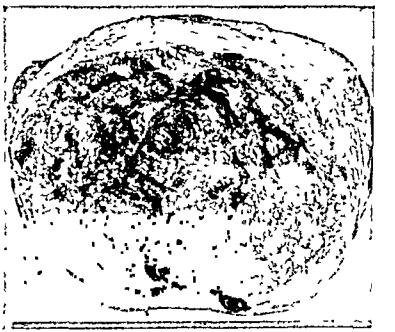

Fig. 4.—Placenta with characteristic crater.

CONCLUSIONS

1. The incidence of severe abruptio placentae in 25,977 deliveries performed in a six-year period at the Harlem Hospital, New York, was 1 in 316.

2. Although toxemia was frequently present in patients with severe abruptio placentae (45.1 per cent) existence of toxemia prior to admission could be established in only twenty-four of the thirty-seven patients with toxemia. This represents 29.2 per cent of the total number of patients with severe abruptio placentae and 64.8 per cent of those in this series *who had evidence of toxemia.*

3. Since hemorrhage (and hypofibrinogenemia, which prolongs the hemorrhage) are among the most serious complications of this obstetrical catastrophe, immediate recognition and hematologic therapy are indicated even before definitive treatment is commenced.

4. Bleeding from other than the placental site may occur as the result of depletion of fibrinogen in the circulating blood.

5. Hysterectomy may not be necessary for the treatment of the Couvelaire uterus if fibrinogen levels are maintained and lost blood replaced.

6. Although the method of delivery must be designed to fit the individual case, pelvic delivery with pitocin stimulation appears to offer the best prognosis for the infant.

7. Prompt and adequate treatment of severe abruptio placentae should be instituted in an attempt to lower the maternal mortality rate, which in the authors' series was 3.6 per cent against an overall maternal mortality rate of 0.19 per cent.

8. The staggering fetal mortality (75 per cent) calls for further study in an attempt to increase fetal salvage.

RÉSUMÉ

L'auteur présente une étude de 82 cas de placenta abruptio grave sur 25.977 accouchements au Harlem Hospital, New York, d'octobre 1949 à octobre 1955. Les données suivantes sont relievées:

1. Fréquence: 1 cas sur 316.

2. Taux de mortalité de la mère: 3,6%.

3. Les anomalies graves accompagnant le placenta abruptio sont énumérées dans leur ordre de fréquence. La toxémie, l'hypofibrinogénie et l'hémorragie sont discutées; le traitement des cas d'urgence en obstétrique est développé, en insistant sur la nécessité d'un traitement adéquat rapide.

RIASSUNTO

Viene presentata una serie di 82 casi di grave rottura di placenta, verificatisi su 25.977 parti all'Ospedale Harlem di New York dall'ottobre del 1949 all'ottobre del 1955. I dati più importanti sono i seguenti:

1. Frequenza 1 su 316.

2. Mortalità materna 3,6%.

3. Vengono elencate, in ordine di frequenza, le più gravi anomalie associate alla rottura di placente. Vengono considerate, inoltre, la tossiemia, la ipofibrinogenemia, l'emorragia, e infine la cura di questa condizione che richiede un intervento urgente e adeguato.

ZUSAMMENFASSUNG

Es liegt ein Überblick über 82 Fälle von schwerer Plazentarablösung vor, die unter 25977 Entbindungen im Harlem-Hospital in New York in der Zeit vom 1. Oktober 1949 bis 1. Oktober 1955 vorkamen. Die folgenden Angaben werden gemacht:

1. Häufigkeit des Auftretens der Erkrankung: ein Fall unter 315 Entbindungen.

2. Sterblichkeitsquote unter den Müttern: 3,6 Prozent.

3. Die schweren Abnormitäten, die mit schwerer Plazentarablösung einhergehen, werden in der Reihenfolge ihrer Häufigkeit aufgezählt. Blutvergiftung, Mangel an Fibrinogen im Blut und Blutungen werden erörtert. Die Behandlung dieses geburtschilflichen Notzustandes wird beschrieben, und auf die Notwendigkeit unverzüglicher und hinreichender Behandlung wird hingewiesen.

SUMARIO

Um relatório de 82 casos de severa abruptio placentae, que ocorren entre 25.977 partos no Harlem Hospital, Nova York, de 1 de outubro de 1949 a 1 de outubro de 1955, é apresentado. Notaram-se os seguintes dados:

1. A incidência foi de 1 em 316.

2. A média de mortalidade materna foi de 3.6%.

3. As graves anormalidades associadas com severa abruptio placentae estão enumeradas por ordem de frequência. A toxemia, a hipofibrinogenemia e a hemorragia são discutidas, e o cuidado desta emergência obstétrica, com ênfase no tratamento pronto o adequado, é delineado.

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The *Materia Medica* of Sir Theodore Mayerne, fellow of the College and physician to four kings affords a tolerable specimen of credulity and superstition His power for gout had, among other things, rasping of a human skull unburied, for hypochondriasis, an ointment made from adders, bats, sucking whelps, earthworms, hog's grease, marrow of a stag, and of the thigh bone of an ox The lungs of a man who had suffered violent death, the liver of frogs, the blood of weasels, and many other ingredients, worthy of the witches' cauldron, were specifics with this great doctor

—*William Wadd*, circa *1827*

Rupture of the Uterus Resulting from Placenta Accreta

Report of a Case

ARTHUR P. MARTINI, M.D., F.A.C.S., F.I.C.S.

EUGENE, OREGON

PLACENTA accreta has been defined as an abnormal adherence of part or all of the placenta to the uterine wall, with partial or complete absence of the decidua basalis, especially the spongiosum layer.[1]

The degree of invasion by the villi affords a pathologic classification. Thus, "placenta accreta" describes superficial adherence, "placenta increta" deep penetration of the myometrium, and "placenta percreta" complete penetration by the villi through the myometrium to the serosal surface.[2] If all the cotyledons are involved the condition is called "total accreta"; when only some of them are involved, "partial accreta," and if only one is involved, "focal placenta accreta."

The actual incidence has not been determined. De Carle, in answer to a questionnaire, stated that only a small number of the cases observed have been reported.[3] The positive diagnosis of placenta accreta is made on the basis of failure to find a line of cleavage between the placenta and the uterine wall on intrauterine examination.[4]

The management of a case of placenta accreta depends on the symptoms and conditions. Hysterectomy is indicated in cases of active bleeding and/or rupture of the uterus. The patients selected for conservative management should be those who have had minimal bleeding and minimal manipulation, and patients by whom future pregnancy is desired and considered important. Their cases are managed by the use of blood, antibiotics, oxytocics and packing.[5]

Schuyler[6] was able to collect only 10 cases of rupture of the uterus due to placenta accreta, and he reported the eleventh. The case to be reported here adds 1 more to the list.

REPORT OF A CASE

Mrs. K. C., aged 36, gravida 4, para 3, with no history of previous operations or intrauterine manipulations, was admitted to the Sacred Heart Hospital on Jan. 18, 1951, at 4:20 p.m., under the service of her attending physician. Her most recent menstruation had occurred on Jan. 21, 1950, and the estimated date of confinment was March 28, 1951. The membranes had ruptured on January 11, of that year, and she had been treated at home by bed rest and antibiotics. She entered the hospital because of pain in the left lower abdominal quadrant and loss of a small amount of bright red blood. Shortly after admission the pain subsided, and on January 19, at 10.15 a.m., contractions began. At 5:10 p.m. dilatation was complete.

At 5:25 a girl weighing 1,160 Gm. was delivered spontaneously. At 6 p.m. the placenta had not yet been delivered. There was very little external bleeding, but the pulse was thready, and the blood pressure could not be obtained. A cut down on the cubital vein was performed and a blood transfusion started. The patient rallied slightly but soon relapsed into shock. At 8 p.m. a consultation was called for. The patient was anesthetized as soon as possible after a transfusion had been started in the other arm. Both transfusions were

From the Department of Obstetrics and Gynecology, Sacred Heart General Hospital, Eugene.

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given under pressure.

The uterus was explored, a tear was observed on the anterior surface. No attempt was made to remove the placenta at this time. The cord was cut off near the vulva. The abdomen was opened in the midline, and two large hematomas were observed. The largest, approximately 8 cm. in diameter, was in the left broad ligament. The second was about half that size and under the bladder reflection. The bladder was reflected downward, and a tear 3 inches (7.5 cm.) long was observed on the anterior surface of the uterus. Owing to the anatomic disturbance caused by the hematomas, the tear was so extended that the interior of the uterus could be used as a landmark A second tear was present on the left. It was 1 inch (2 5 cm) long and extended into the hematoma of the left broad ligament. Subtotal hysterectomy was done. The patient was given a total of eleven blood transfusions before, during and after the operation.

Microscopic sections revealed thinning of the myometrium, with trophoblastic cells and chorionic villi extending to within 1 low-power microscopic field of the uterine serosa of the uterus. The diagnosis was placenta accreta.

The patient had a stormy course for three days and from then on made an uneventful recovery. She was discharged on the twelfth postoperative day, having been kept a few days longer than usual because she lived sixty miles away, in a forest camp where her husband was a ranger. The infant did not do well, and on February 4, was operated on for intestinal obstruction. At the operation the signs observed were those of meconium ileus. After the operation the infant began to improve, but on February 8, she died, owing to aspiration of regurgitated material.

Invasion of placenta close to serosal surface.

RIASSUNTO

L'autore riferisce un casi di rottura uterina dovuta ad una placenta accreta, il quale, almeno per quanto è stato possibile determinare, è il dodicesimo della letteratura.

Si trattava di una donna di 36 anni, pluripara. La cura ebbe esito felice e la paziente guarì dopo una convalescenza burrascosa. La neonata, unabimba di 1160 grammi di peso, sembrava potesse sopravvivere, ma morì meno di un mese dopo la nascita per polmonite ab ingestis.

RÉSUMÉ

L'auteur rapporte un cas de rupture de l'utérus due à des adhérences du placenta qui est, selon lui, le douxième cas de ce genre publié. Il s'agit d'une femme de 36 ans (quatre grossesses, trois accouchements). Bon résultat après une convalescence riche en incidents. Le nouveau-né (sexe féminin, poids 1,160 Gm.) paraissait devoir survivre mais mourut moins d'un mois plus tard après avoir aspiré des matières régurgitées.

RESUMEN

El autor comunica un caso de ruptura uterina por placenta acreta; segun él se trata del doceavo caso reportado en la literature. La paciente fué una mujer de 36 años, multigrávida. El tratamiento tuvo éxito y el paciente se recuperó después de una convalescencia tormentosa. El producto, una niña de 1,160 gms, murió antes de cumplirse un mes de su
consecuencia de una aspiración
rial regurgitad

SUMARIO

O autor apresenta um caso de rutura uterina devido a placenta "acreta," que até onde pôde constatar, é o 12° da literatura. A paciente era uma mulher de 36 anos, grávida 4, para 3. O tratamento foi bem sucedido e depois de tempestuosa convalescença a paciente se restabeleceu. A criança, uma menina pesando 1,160 gr. deu a impressão de que ia viver, mas faleceu menos de um mês após o nascimento devido à aspiração de material regurgitado.

ZUSAMMENFASSUNG

Der Verfasser berichtet über einen Fall von Gebärmutterruptur infolge von Placenta accreta. Soweit der Verfasser feststellen konnte, handelt es sich um den zwölften bisher veröffentlichten Fall dieser Art. Die Patientin war eine 36 jährige Frau, die drei Kinder geboren hatte und sich in der vierten Schwangerschaft befand. Die Behandlung war erfolgreich, und die Kranke erholte sich völlig nach einer stürmischen Rekonvaleszenz. Das Kind, ein 1160g schweres Mädchen, schien erst gewisse Aussichten zu haben, am Leben zu bleiben, starb aber noch vor Ende des ersten Lebensmonats infolge von Einatmung aufgestossenen Materials.

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In the court of the Kings of Wales. the physician or surgeon was the twelfth person in rank. and appears to have had by law certain established fees. For curing a fleshwound that was not dangerous. he was allowed no other perquisite than such of the garments of the wounded person as were stained with blood; but for curing any of the three dangerous or mortal wounds. he was allowed a fee of one hundred and eighty pence. and his maintenance, besides the blood-stained garments.

—*William Wadd*, circa *1827*

Late Surgical Results of Use of the Intraocular Acrylic Lens

HAROLD RIDLEY, M D , F R C S (Eng), F I C S (Hon)
LONDON, ENGLAND

AFTER an interval of several years it is of interest to review briefly a complete series of surgical results of the use of the intraocular acrylic lens All patients who underwent this operation while in the general wards of St Thomas's Hospital in 1951, 1952 and 1953 were sent for early in 1956 The majority attended and were examined and refracted by the Ophthalmic Registrar, Miss F V Tallack This list omits 2 patients operated on before 1951 for whom the standard lens was not used and 5 in whose cases deliberate intracapsular extraction was employed, a technic soon abandoned because of the almost invariable late dislocation of the acrylic lens into the base of the vitreous

The results are summarized in the accompanying table

It will be noted that, after a long postoperative period, rather more than one-half of the eyes retain corrected acuity of 6/12 (20/40) or better, one-third 6/9 (20/30) or better and one-quarter 6/6 (20/20) or better These proportions show some deterioration when compared with those published in 1954, after a shorter postoperative interval, when two-thirds had 6/9 and one-third 6/6 vision, and with the 1955 series in which two-thirds had 6/12 and one-half 6 9 or more While it may be fair to say that the majority of successfully treated patients have retained their sight throughout the years, some have met with misfortune

Judged on visual acuity alone these results are inferior to those of plain extraction, but it must be emphasized that postoperative central acuity is not the only criterion by which the operative results should be compared The acrylic lens does not magnify the image by one-third, so that, in a patient with an acrylic lens 6/9 acuity is really equivalent to 6/6 through an aphakic correction Moreover, a lens in the natural position provides natural sight with a full undistorted visual field The eye can be used together with the other eye, which may slowly be deteriorating, and heavy and unsightly cataract glasses are not necessary to provide even moderate sight In some patients, especially those with monocular cataract, natural vision even with as little as 6/18 acuity may be adequate and indeed preferable to a better central acuity obtained with the aid of strong lenses Reading sight with an intraocular acrylic lens is often surprisingly good, and there are few eyes which cannot read small print even if the vision for distance is only moderate

It is evident that in cases of monocular cataract the incidence of preoperative complications, such as traumatic subluxation or uveitis, which may a

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the result, is likely to be greater than average.

More is generally to be learned from failures than from successes, and in general the cause of trouble is fairly evident, surgical errors and late dislocation being the principal defects.

There have been late dislocations in 4 patients. The first, a boy aged 12, had an anterior dislocation resulting from a blow on the eye from a fist, after six months with an acuity of 6/9. The others were spontaneous posterior dislocations, 1 six months at 6/9, the second after twelve months with the same acuity and the third never having achieved an acuity of more than 6/36. In at least 1 of these cases and possibly in the others it is known that the posterior lens capsule was inadvertently removed, although the intention was to perform an extracapsular operation. Posterior dislocation of the lens cannot occur unless the posterior capsule or zonule has been torn, and it seems probable that, in the absence of a blow on the eye, most if not all such rents are caused at the time of the operation or, in cases of traumatic cataract, before it. It is not certain that spontaneous posterior dislocation of an acrylic lens has ever occurred with the zonule and posterior capsule intact when the lens was inserted. Inadvertent removal of the entire capsule may occur unless the stronger anterior layer is carefully incised before its center is torn out with forceps, and, since the zonule and posterior capsule are so much thinner, it is important that any residual tags of anterior capsule should be cut with iris scissors and not just pulled away. If only a satisfactory method could be devised to prevent a lens from slipping downward over the face of the vitreous, e.g., suspension of the lens by a projection hooked into the peripheral irridectomy, the incidence of late complications could be greatly reduced, and it would then be possible to employ intracapsular extraction, which is usually followed by little postoperative reaction and high visual acuity so long as the lens remains in place. Except in the 1 case of trauma there was no anterior dislocation in this series; indeed, anterior dislocations have been very few among the large number of acrylic lens operations I have now performed.

Of the other 4 patients with acuity less than 6/60, 1 had postoperative prolapse of the iris, loss of the anterior chamber and chronic iritis. One has an opaque vitreous, probably from hemorrhage, and 2 others suddenly lost the anterior chamber and chronic iritis developed, probably because some soft lens matter was left in the eye at operation. This appears to be the most common and important surgical fault, and failure should be expected unless a perfect extracapsular extraction is performed before an acrylic lens is inserted.

The reasons for only moderate visual results (less than 6/12 but more than 6/60) in a quarter of the cases seem to be as follows: In 4 a dense posterior lens capsule, with probably a little adherent cortical matter, was to blame; in 1 of these the acuity had dropped from 6/6 to 6/18, but in the other 3 the visual standard has been constant. From this it seems that a posterior capsule kept taut by pressure from the acrylic lens shows little tendency to thicken or fold in the course of years. In 2 cases the moderate result is attributable to inflammatory deposits on the front of the lens, though generally these clear completely in time. In 2 cases the visual defect was caused by subluxation; in 1 of these late displacement occurred, the acuity dropping from 6/9 to 6/36, but in the other, in which no acuity above 6/36 was ever obtained, it was probably due to a defective operation. In 1 other case moderate acuity was the result of corneal trauma, to which, in this instance, the

Results

Name	*Age*	*Operation and Dates*	*Best Acuity Recorded*	*Present Acuity*	*Comments*
E S	46	1/3/51, r acrylic 14/9/55, corepraxia 20/2/56, corepraxia	RV —1 5DS = 6/6 —1 5DC/60° 17/11/55	6/60	After 6/6 acuity for 4 years iritis developed, resulting pupillary membrane divided successfully, with restoration of full visual acuity, second attack treated similarly but unsuccessfully to date
E B	45	10/5/51, r acrylic	RV 6/6 unaided 6/5 —0 5DS 28/5/51	6/6 unaided —1 0DC/70° = 6/5	Cataract secondary to cyclitis
J R	68	25/7/51, r acrylic	RV +0 5DS = 6/9 —1 0DC/180° 30/8/51	6/12 unaided	Not seen since 1952
K K	68	25/7/51, r acrylic	RV —1 0DS = 6/6 —2 0DC/75° 21/1/52		Not seen since 1952
P H	12	8/8/51, l acrylic 10/11/52, removal of acrylic lens	LV —1 5DS = 6/9 —1 5DC/180° 27/1/52	Aphakic	Traumatic cataract—intraocular F B, blow from fist dislocated lens into anterior chamber, reposition failed, lens removed 1952
C B	66	10/9/51, r acrylic	RV +1 0DS = 6/9 +1 5DC/10° 31/10/51	+1 25DS = 6/4 +0 75DC/170	Posterior capsule extremely thin and possibly not intact
W W	70	17/9/51, l acrylic	LV —1 0DS = 6/12 —1 0DC/70 pt 15/11/51	—0 5DS = 6/6 —1 75DC/90°	
C G	54	20/9/51, l acrylic	LV unaided = 6/12 30/1/52	+2 0DS = 6/9 pt	
S H	64	29/10/51, r acrylic	RV —2 5DS = 6/6 —1 5DC/100° 3/1/52	—2 25DS = 6/5 —2 0DC/100	
J C	47	24/4/52, r acrylic	RV —7 0DS = 6/9 —1 0DC/50°	—8 0DS = 6/9 —0 5DC/50	Unusually high myopia, unexplained
S B	85	13/12/51, r acrylic 12/3/52, l acrylic	RV —5 0DC/90 = 6/9 pt 17/1/52 LV +1 0DS = 6/24 7/4/52	R —3 0DC/90 = 6/18 L —1 0DC/70 = 6/18	Aged 89 and probably senile macular changes
F W	52	14/5/52, r acrylic	RV —4 5DC/100 = 6/5 26/5/52		Not seen since 1953
A P	69	7/7/52, l acrylic	LV —3 5DC/90 = 6/9 21/9/53	—4 5DC/75 = 6/6 pt	
L S	68	9/7/52, l acrylic 22/6/53, l capsulotomy 24/10/55, l post capsulotomy	LV unaided 6/36 29/6/53	L + 1DS = 6/18	Low acuity due to thick posterior capsule

Results

Name	*Age*	*Operation and Dates*	*Best Acuity Recorded*	*Present Acuity*	*Comments*
L.G.	53	24/7/52, r. acrylic	RV = 6/60 just 15/10/53	Below 6/60	Pupil distorted; anterior chamber shallow; cornea degenerate
A.H.	67	13/8/52, r. acrylic	RV —1.0DS = 6/6 —2.0DC/60 4/5/53	—3.5DS = 6/18	Moderate acuity due to thick posterior capsule
S.M.	66	13/8/52, l. acrylic	LV = 6/18	6/9 aphakic	Inadvertent intracapsular—spontaneous dislocation 6 months after operation
J.S.	30	19/11/52, l. acrylic	LV + 1.0DS = 6/9 8/12/52	+0.5DC/90 = 6/9	Cataract secondary to iridocyclitis
B.P.	58	27/11/52, l. acrylic 16/7/53, corepraxia	LV —3.0DS = 6/18 13/10/55	—2.5DS —1.0DC/30 = 6/18	Moderate acuity due to thick posterior capsule
O.H.	87	10/12/52, l. acrylic	LV + 3.0DC/150 = 6/9 pt. 20/5/53	+3.0DC/150 = 6/9	
G.R.	60	2/2/53, l. acrylic	LV 6/24 unaided 5/3/53	+0.5DS —1.75DC/70 = 6/4	R. intraocular acrylic lens inserted 1956
R.H.	43	11/2/53, r. acrylic	RV —3.0DS = 6/6 pt. —3.0DC/75 27/5/54	—4.0DS = 6/18 —3.0DC/75	Drop of acuity from 6/6 attributable to slight displacement of lens
A.D.	71	22/4/53, r. acrylic	RV —1.5DS = 6/6 pt. —2.0DC/90	—1.5DS = 6/5 —2.5DC/75	
A.R.	50	23/2/53, r. acrylic	RV —3DS = 6/24 pt. 9/4/53	—3.0DS = 6/36 —3.5DC/180	Traumatic cataract—deterioration from 6/9 caused by subluxation of lens
R.K.	61	22/1/53, l. acrylic 11/6/53, l. division posterior synechiae	LV —2.5DC/135 = 6/36 18/2/54	—3.0DS = 6/12	Severely injured in motor accident in July 1954
A.W.	72	12/2/53, r. acrylic	RV = PL 2/7/53		Pneumonia third postoperative day, followed by iritis and loss of anterior chamber; 6 weeks after operation, glaucoma; eye became blind and painful; lens removed April 1954 and enucleation done December 1955 (elsewhere)
P.C.	68	22/4/53, l. acrylic 25/8/53, dislocated	LV unaided 6/18 8/6/53		25/8/53, dislocation of acrylic lens, apparently spontaneous; present acuity with aphakic correction, 6/18

Results

Name	*Age*	*Operation and Dates*	*Best Acuity Recorded*	*Present Acuity*	*Comments*
E V	60	4/5/53, r acrylic 22/6/53, corepraxia	RV —1 0DS = 6/9 —2 0DC/90 30/1/56	—0 25DS = 6/24 —2 0DC/95	*No cause apparent for* drop of visual acuity
F N	64	1/6/53, r acrylic	RV —6 0DC/90 = 6/12	—6 0DC/90 = 6/18	Moderate acuity due to lens tilt
E T	35	15/6/53, l acrylic 20/6/53, 2 corneo-scleral sutures 25/6/53, peripheral iridectomy with reposition of iris	LV +2 0DS = 6/12	6/12	Not personally examined since 14/9/53
M B	51	29/7/53, r acrylic	RV —1 0DS = 6/9 pt —2 0DC/70 20/5/54	RV 6/24 unaided	Cause of visual deterioration not evident
W A	49	6/8/53, r acrylic 17/2/54, corepraxia 1/1/55, dislocated	RV = 6/36 3/9/53		Dislocation apparently spontaneous 11 months after corepraxia
H T	84	28/9/53, r acrylic	RV = PL 11/11/55		Probably old vitreous hemorrhage, no fundus reflex
A McK	67	30/9/53 r acrylic 24/10/53, l acrylic	RV —6 0DS = 6/9 LV —6 25DS = 6/12 —4 0DC/170 19/1/56	RV —6 5DS = 6/9 —3 5DC/90 LV —6 25DS = 6/6 +4 0DC/170	Good bilateral result in myope
J M	89	10/10/53, r acrylic 5/5/54, corepraxia	RV unaided = 6/9 pt 9/8/54	—1 0DS = 6/12 —0 5DC/80	
M G	62	11/11/53, l acrylic	LV —2 0DS = 6/9 —3 0DC/100 21/1/54		Not seen since 1954
J L	30	25/11/53, r acrylic	RV —3 0DS = 6/9 —2 25DC/10 6/2/56	—3 0DS = 6/9 +2 25DC/10	Traumatic cataract, perforating wound
A W	67	26/11/53, l acrylic 25/2/54 removal of acrylic lens	LV = PL 1/2/54		Anterior chamber lost, glaucoma, lens removed
F L	53	30/12/53, l acrylic	LV —1 5DS = 6/12 —2 5DC/10 7/7/55	—3 5DS = 6/12 —1 0DC/120	
G I	76	24/9/52, l acrylic 15/1/53, discission 17/6/53, r acrylic 7/9/53, corepraxia	LV unaided 6/18 pt 21/11/55 RV —3 0DS = 6/18 —2 0DC/20 9/8/54	LV —1 0DS = 6/12 RV = CF	R posterior capsule somewhat thickened
E V	65	23/2/53, r acrylic 14/10/53, l acrylic	RV —6/9 unaided LV = 6/9 unaided 22/9/55	RV —1 5DC/150 = 6/12 LV —1 5DC/30 = 6/6	Good bilateral result

cataract was due. In the remaining 2 cases the cause is obscure: in 1 of the patients the eye may always have been amblyopic, and in the other, aged 89 years at the time of writing, senile macular changes may be present, though they cannot be accurately observed.

The method of cleaning and sterilizing the lens by immersion in 1 per cent cetrimide has been criticized. I have reviewed it many times but am convinced that, in actual practice, little trouble has been attributable to it. There has been no intraocular infection, and in my opinion neither the lens material nor the sterilizing solution is responsible for much if any of the temporary iritis that habitually follows the operation, for when an acrylic lens has been inserted after intracapsular extraction, whether intentional or inadvertent, there is surprisingly little postoperative reaction. Postoperative iritis seems to be associated with the extracapsular technic and the retention of cortical and capsular lens remnants within the eye rather than with the acrylic material or the cetrimide.

A dense inflammatory membrane can be divided, as in capsulotomy, and this has been done in 7 cases of this series, often with most gratifying results, for the lens is generally quite clean beneath the pupillary membrane. This small operation (corepraxia) can be done without admitting the patient to the hospital and is usually followed by an acuity of 6/12 within one week. Posterior capsulotomy, in which the capsule is incised with a Ziegler knife passed through the pars plana and behind the lens, is more difficult and requires inpatient aftercare.

SUMMARY

From this short analysis of the results of using the intraocular acrylic lens, it appears that the cause of failure, when it occurs, is usually evident, the complication most to be feared being late dislocation, the lens sliding behind the iris into the base of the vitreous chamber. Fortunately the acrylic lens, when dislocated into the vitreous, is better tolerated than is the human lens, and good acuity with a cataract glass may result. If the other eye is normal, however, this is not of much practical value.

An operation originally successful seldom gives serious trouble unless dislocation occurs, and the patient can retain good sight without evidence of foreign body reaction or degeneration of intraocular structures for at least five years and probably indefinitely. No more effective treatment for monocular cataract has yet been devised, and if a safe method could be invented for fixing the lens securely in the patellar fossa to prevent posterior dislocation the risk of late complications would probably be comparable with those of plain extraction.

Author's Note: My thanks are due to Dr. Tallack for performing refraction tests on nearly all of the patients in this series.

RÉSUMÉ

L'auteur discute les résultats tardifs de l'emploi de la lentille intraoculaire en acrylique, et déclare qu'il n'existe à ce jour aucun autre mode de traitement plus efficace. Les malades chez lesquels le traitement original a été couronné de succès gardent une bonne vision, sans trace de corps étranger ni de dégénérescence des structures intraoculaires, cela pendant cinq ans au minimum et probablement pour une période indéfinie, à moins d'une dislocation.

La dislocation est la complication la plus sérieuse. Lorsqu'elle se produit la lentille glisse derrière l'iris dans le corps vitré où, heureusement, elle est mieux tolérée que la lentille naturelle, de sorte qu'une bonne acuité visuelle peut être obtenue avec une lentille artificielle lorsque l'autre

oeil est aussi atteint. Si une méthode sûre pouvait être trouvée afin de fixer solidement la lentille dans la fosse patellaire, le risque de complications tardives serait probablement comparable à celui d'une simple extraction.

RIASSUNTO

Vengono presentati i risultati lontani nell'impiego della lente acrilica intraoculare. Fino ad ora non esiste un metodomigliore nella cura della cataratta monolaterale. I malati in cui questo metodo ottenne successo hanno una buona visione, senza segni di reazione al corpo estraneo nè lesioni delle strutture interne dell'occhio, e ciò per almeno cinque anni o forse anche per sempre, a meno che non avvengano degli spostamenti.

Lo spostamento è la complicanza più grave e quando avviene la lente scivola al di dietro dell'iride nella camera del vitro, dove—per fortuna—è meglio tollerata che non la lente naturale e consente una buona visione.

Se fosse possibile trovare un metodo per fissare con sicurezza la lente nella fossa patellare, il rischio delle complicazioni tardive potrebbe essere paragonabile a quello della estrazione.

ZUSAMMENFASSUNG

Der Verfasser erortert die Verwendung der introkularen Acryl-Linse und weist darauf hin, dass es noch keine sichere wirksame Methode zur Behandlung des einseitigen Katarakts gibt. Wenn der erste Eingriff erfolgreich ist, konnen die Kranken eine gute Sehkraft beibehalten, ohne dass es zu Fremdkorperreaktionen oder zu degenerativen Veranderungen an den Gebilden innerhalb des Augapfels kommt. Wenn die Linse sich nicht verschiebt, lasst sich ein solcher gunstiger Zusand fur die Dauer von wenigstens funf Jahren beobachten und kann sich wahrscheinlich fur unbegrenzte Zeit erhalten.

Die Verschiebung der Linse ist die schwerste Komplikation. Tritt dies ein, dann gleitet die Linse hinter der Iris in den Glaskorper, wo sie glucklicherweise besser vertragen wird als die naturliche Linse, sodass sich, wenn das andere Auge auch nicht normal ist, mit einem Kataraktglas noch gute Sehkraft erzielen lasst. Wenn sich ein sicheres Verfahren zur Fixierung der Linse ausarbeiten liesse, dann wurde das Risiko spaterer Komplikationen wahrscheinlich ungefahr mit dem vergleichbar sein, das man bei einfacher Extraktion eingeht.

SUMARIO

O autor discute os últimos resultados do uso das lentes intraoculares acrílicas declarando que outro tratamento mais eficaz para catarata monocular ainda não foi inventado. Pacientes cujo tratamento original foi bem sucedido podem ficar com bôa visão, sem evidência de reação a corpo extranho ou degeneração nas estruturas intraoculares, pelo menos durante cinco anos e provàvelmente durante um período indefinido, a menos que ocorra dislocação.

A dislocação é a complicação mais grave: quando isto ocorre a lente escorrega por detrás da iris para a câmara vítrea, onde, felizmente, é melhor tolerada do que a lente natural, de maneira que se pode obter bôa visão com um vidro catarata quando o outro ôlho é também anormal. Se se pudesse inventar um método seguro para fixar a lente na fossa patelar, o risco de complicações tardias seria provàvelmente comparável com aquele da simples extração.

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The Diagnosis of Sinusitis

HERBERT P. HARKINS, M.D., F.A.C.S., D.A.B.*

PHILADELPHIA, PENNSYLVANIA

DESPITE the so-called antibiotic new era of medicine and particularly of oto-aryngology, the basic symptoms and signs leading to the diagnosis of sinusitis remain unchanged. There have been, however, alterations in diagnostic methods and additions to established technics that effectively assist in reaching the correct diagnosis in some of our more puzzling patients.

In any discussion of the diagnostic features of sinusitis, one must first consider the patient's history. A brief one, carefully taken, will usually indicate that the symptoms commenced after an infection of the upper part of the respiratory tract or after swimming or diving. Burning of the interior of the nose and blockage of the nose, especially of one side, ensues, and the upper part of the respiratory tract feels generally uncomfortable. Lassitude, fever, restlessness and malaise are commonly present with all types of sinusitis, the degree depending on the severity of the attack. If the patient is allergic, the onset is frequently sudden, with profuse watery rhinorrhea, sneezing and nasal blockage. Often there is a definite familial trend in the occurrence of these complaints. Cough, wheezing, and bronchial asthma with dyspnea may also accompany the onset.

Acute Suppurative Sinusitis. — Headache is a constant sign and is usually localized over or near the sinus involved, with a rather definite pattern of referral. It is usually at its maximum in the early morning or on arising and gradually diminishes as the day progresses. Maxillary sinusitis produces pain over the involved cheek, often referred to the frontal area. The upper premolars and molars are painful, and this is exaggerated on quickly closing the jaws and snapping the teeth together. If the patient is edentulous, the pain is still present in the same areas, often making him feel that infected teeth are still attached to his jaw. The cephalgia of anterior ethmoiditis is centered at the root of the nose or in the orbit, and that of the posterior ethmoidal cells is also commonly felt in the orbit of the infected side or at the occiput. The pain of frontal sinusitis is localized over the sinus involved, and that of sphenoid sinusitis is characteristically present at the occiput. Rarely, pain may not be an outstanding symptom of sinusitis, and occasionally it is present in a somewhat bizarre location. The foregoing outline, however, includes the areas most frequently affected by pain associated with sinus disease.

Tenderness to palpation is usually found over the affected sinus area when acute sinusitis has developed but it may be minimal or absent when the process has reached the chronic stage.

Edema too is usually present over the pathologic sinus, and its extent is often an index of the severity of the infection. In cases of frontal sinusitis and particularly of anterior ethmoid infection, edema of

*Professor of Otolaryngology, Hahnemann Medical College, Philadelphia.

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the eyelids is frequently encountered and occasionally its extent is sufficient to close the lid. This is observed with especial frequency in children.

Rhinoscopic Examination: In the presence of acute suppurative sinusitis the nasal mucosa is inflamed and edematous. The turbinates traditionally are hypertrophic, the meati are partially or completely occluded and mucopus is present. If the infection involves the anterior or major group of sinuses (frontal, maxillary or anterior ethmoid cells), this tenacious white or yellow discharge will be seen in the middle meatus, dropping down over the roof of the inferior turbinate to the nasal floor. In cases of frontal sinusitis it is usually observed in the anterior third of the middle meatus, while in the presence of ethmoid and maxillary infections it is more often seen in the middle or posterior third of the meatal cavity.

When the posterior or minor group of sinus cells (posterior ethmoid or sphenoid) is included in the pathologic process, this same thick white or yellowish mucopus will be seen on nasopharyngoscopic or posterior nasal mirror examination to be clinging to the region of the superior meatus.

In most patients it is necessary to anesthetize the oropharynx and nasopharynx thoroughly in order to examine the superior meatus area satisfactorily, but the knowledge gained is certainly worth the time consumed.

Transillumination is most helpful in establishing the diagnosis of sinusitis and should be performed routinely as a part of the diagnostic study. Only a completely darkened room will provide the necessary contrast, and the examiner should allow ample time for his eyes to become accommodated to darkness. In examining the frontal sinuses the light is placed below the supraorbital plate; it fills the sinus cavity and passes through the anterior sinus wall. The diffuse light that emerges is compared with that seen in the unaffected side. When sinusitis is present the side involved is darkened, often in proportion to the pathologic condition present. When the involvement is bilateral, the examiner must trust his memory.

In examining the ethmoid and maxillary sinuses the light is inserted within the oral cavity and directed upward against the roof of the mouth. The amount of light emerging from the cheek of the affected side is compared with that observed on the healthy side. At the same time, the amount of light coming through each ethmoid cavity is compared with that which comes through the others, and the light passing through each orbit and seen through the pupil is noted and evaluated. This provides an index to the existing ethmoid disease. As a check, it is prudent to do the test in reverse, that is, by placing the light tube against the cheek, having the patient extend his head with the mouth open, and then noting and comparing the amount of light that comes through each side of the hard palate. In performing these studies, one must always consider the individual variation and thickness of the facial bones.

Antral Puncture: If the history, the rhinoscopic observations and the results of transillumination suggest suppurative maxillary sinus disease, antral puncture and irrigation should be considered for both diagnosis and therapy. They should not be performed, however, in the presence of highly acute tenderness, swelling, edema and fever. A delay of forty-eight to seventy-two hours, until some tissue resistance has been established, is desirable.

I prefer to make the original puncture under the inferior turbinate with a Lichtwicz needle, for the sinus cavity is more thoroughly lavaged with this technic. The washings should be carefully collected and examined. If purulent sinusitis is present,

	Suppurative Sinusitis	*Allergic Sinusitis*
History	Pain, fever, unilateral tenderness, discharge, edema. Onset with purulent infection of the upper part of the respiratory tract, or after swimming or diving.	Sneezing, rhinorrhea, bilateral blockage, itching, burning; familial incidence of sypmtoms.
Rhinoscopic Data	Mucopus present in middle or superior meati, or both; mucosa inflamed and edematous; polypi absent; tenderness and edema over involved sinus area.	Mucosa pale, boggy, and moist; mucoid secretion; polypi often present, originating in middle meatus and extending to nasopharynx.
Headache	Centers over sinus involved, with definite pattern of referral.	Generalized headache; no definite referral.
Roentgen Data	Mucosal thickening confined to sinus involved; fluid level often present; polypi rare.	All sinuses show mucosal thickening; fluid level rare; polypi prominent.
Cytologic Data	Neutrophils in abundance; few eosinophils.	Eosinophils in abundance; no neutrophils.

mucopus, débris and exudate will be clearly evident. These may be examined cytologically if there is a question of underlying or associated allergy. Diagnostic irrigation of the frontal and sphenoid sinuses may also be done but is much more difficult to perform, and often no appreciable amount of mucopus, débris or exudate is obtained.

Roentgenographic Studies: Roentgen studies are, of course, of great value but must always be considered in the light of the clinical data. Roentgen evidence alone is rarely a sufficient basis for a definite diagnosis.

Unilateral generalized mucosal thickening and the presence of a fluid level usually mean that suppuration has occurred. Bilateral or generalized hypertrophy of the mucous membranes, especially if it is polypoid, suggests the presence of allergy. In questionable cases, or when it is suspected that new growths or foreign bodies are present, radiopaque studies are most helpful and should certainly be performed. Of the various roentgen studies made of the sinuses, those of the ethmoids are the least satisfactory from the point of view of accuracy, for there are many superimposed cellular bony trabeculae on each film, and these may easily confuse both the rhinologist and the radiologist. Corroborating rhinoscopic and clinical signs must be present before the diagnosis of ethmoid sinusitis is established.

Allergic Sinusitis. — Allergy involving the sinuses is usually present in cases of clinical allergic rhinitis. As has been mentioned, there is usually a history of spasmodic sneezing, rhinorrhea, nasal blockage, anosmia and mucosal burning.

Rhinoscopic study traditionally shows a pale, boggy nasal mucosa, much thin watery secretion, hypertrophied turbinates and polypi. Occasionally the mucosa is inflamed and edematous, and sometimes a white or yellowish secretion is present. On cytologic examination this type of secretion proves to be composed almost exclusively of eosinophils. The polypi are purplish-gray. They originate in the middle meati and extend posteriorly to the nasopharynx, and they are present bilaterally. The polypi associated with suppurative sinusitis are granulomatous; they are firm and fibrous and usually single and unilateral. Roentgen studies usually show bilateral thickening of the sinus mucosa, often with associated polypi or a mucocele within the lumen of the sinus.

Cytologic Study: Cytologic examination of nasal and sinus secretion in the washings is one of the most helpful and gratifying studies the rhinologist can perform.

It is simple and requires little time, and it should be done during the initial visit in all cases of questionable diagnosis Hansel's or Wright's stain may be used If suppuration is present, neutrophils will be present in abundance, if allergy is the causative factor, eosinophils will be present If allergy and suppuration coexist, the type of cell that is present in the greater number will usually indicate which pathologic process is predominant After therapy has been instituted, the change in the type and number of cells observed in the secretions is an excellent index of improvement

These, then, are the essential examinations and studies that must be made for a correct and efficient diagnosis of sinusitis *They may be summarized in tabular form*

Many of these signs and symptoms are elementary to the busy practicing rhinologist, yet how often do rhinologists attempt to by-pass or minimize them? No one can deny that they are important, and certainly the conscientious application of the tests here mentioned will invariably lead one to the correct diagnosis of sinusitis, even in the most puzzling cases

SUMMARY

The signs and symptoms that indicate (1) suppurative and (2) allergic sinusitis *are enumerated, and the use of diagnostic* methods, such as rhinoscopic, roentgenographic and cytologic examination and antral puncture, are described The *author emphasizes the importance of tak*ing a thorough history of each patient whose symptoms suggest the presence of sinusitis

RÉSUMÉ

L'auteur decrit les signes et symptômes 1) de la sinusite purulente, 2) de la sinusite allergique, avec leurs moyens de diagnostic (examen rhinoscopique, radiographique et cytologique) Il insiste sur l'importance d'une anamnese approfondie dans tous les cas ou les symptômes suggerent la presence d'une sinusite

RIASSUNTO

Vengono elencati i sintomi della sinusite suppurativa e di quella allergica ed i metodi per la diagnosi, quali la rinoscopia, gli esami radiologici e citologici e il quadro dell'antro E' molto importante raccogliere una accurata anamnesi in ogni caso

SUMARIO

O autor enumera os sinais e sintomas que indicam (1) sinusite supurativa e (2) alergica e descreve o uso de metodos diagnosticos, tais como o exame rinoscópico roentgenografico e cistologico e o quadro antral O autor salienta a importância de se ter uma história detalhada de cada paciente cujos sintomas sugiram a presença de sinusite

ZUSAMMENFASSUNG

Die Krankheitszeichen und Symptome, die fur (1) die eitrige und (2) die allergische Nebenhohlenentzundung charakteristisch sind, werden aufgezahlt, und die Anwendung diagnostischer Verfahren wie Rhinoskopie, Rontgenuntersuchung, zytologische Untersuchung und Kieferhohlenpunktion wird beschrieben Der Verfasser hebt die Wichtigkeit sorgfaltiger Anamnese bei jedem Kranken, dessen Symptome das Bestehen einer Nebenhohlenentzündung andeuten, hervor

Plastic and Reconstructive Surgery

A Method of Mastopexy with Fascia Lata Transplants

G. KENNETH LEWIS, B.Sc., M.D., F.A.C.S., D.A.B.*

CHICAGO, ILLINOIS

FASCIA lata transplants, in strips or in sheets, have been used successfully for suspension of joints, facial nerve injuries and hernias, as well as in many other branches of surgery. With this in mind, a technic has been devised for raising the ptosed and hypotrophic breasts, employing fascia lata. This procedure seems unique and offers a means of reparative support of the breast with little or no physiologic disturbance to the mammary tissue and with a minimum of morbidity. A search of the literature has failed to reveal a similar technic.

Discussions of mastoplastic repair and descriptions of various mastoplastic procedures have been extensive in the medical literature. Many methods have been attempted, but little standardization of any specific technic has been attained. For example, Girard[1] attacked the problem of prolapse by affixation of the breast to the second rib, attaching the entire posterior aspect of the gland to the pectoral fascia. He did no skin plastic and concealed his crescent-shaped incision beneath the breast, in the mammary fold. He sought to combat the flatness of the ptosed breast by his manner of inserting the sutures for affixation, displacing the upper border of the gland outward to obtain a normal contour.

Goebell[2] used a similar operation but suspended the breast with free fascia lata. Dartigues[3] described a method of suspension and mastopexy for moderate prolapse. Through an incision concealed in the axilla, he shortened the axillary prolongation of the gland and fixed it in a higher position. In cases of more severe ptosis he raised the gland and affixed it to the pectoral fascia through a vertical subareolar incision, excising any excess skin and parenchymal substance. Joseph[4] raised the breast by shifting upward the inner margin of the vertical skin defect in the axillary line. A supra-areolar incision of skin permitted elevation of the nipple.

Many other methods have been reported, too numerous to present in detail, such as those of Passot,[5] Warren,[6] Gillies and McIndoe,[7] Dufourmentel,[8] Axhausen[9] and others.

Anatomic Background.—The breast is formed from modified sebaceous glands and lies upon the superficial fascia. It extends from the second to the sixth rib inclusive. Horizontally it extends from the lateral side of the sternum to the midaxillary line, with about two-thirds of the breast upon the pectoralis major and one-third upon the serratus anterior. At the lower median quadrant the gland rests upon the aponeurosis of the external oblique muscle, which separates it from the rectus abdominis muscle. The tail of

*Clinical Associate Professor of Otolaryngology, University of Illinois College of Medicine; Attending Plastic Surgeon, Cook County Hospital, and Illinois Central Hospital, and Consulting Plastic Surgeon, Illinois Central Railroad, Chicago. Surgical Consultant, United States Fifth Army.

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Spence is a prolongation from the outer part of the gland which passes up to the level of the third rib on the axilla. This process of breast tissue gets into the axilla through an opening in the axillary fascia known as the foramen of Langer. It follows that the axillary tail is under the deep fascia and not, like the rest of the breast, superficial to this layer. The breast is separated from the pectoralis major muscle by fascia, which is the deep fascia. It is anchored to the overlying skin and the underlying pectoral fascia by bands of fibrous tissue called ligaments of Cooper. The nipple lies in the fourth intercostal space, 4 inches (10 cm.) from the midline (Fig. 1).

Indications for Mastopexy.—The socioeconomic indications for repair of conspicuous mammary deformity are those in which such deformities close numerous channels of social activity and disqualify the sufferers for many occupations. Many facets of society and modern culture emphasize physical appearance, and because of the requirements of dress, women with mammary deformities are often hesitant to swim, ride and participate in other activities or to wear decolletage.

Likewise, with the present-day fashion dictates, considerable development of the bust is emphasized, and the girl or woman with a flat chest or small flabby breasts is embarrassed. The young girl who cannot dress like her contemporaries and share in their activities feels isolated and may acquire antisocial traits. The importance of sex in relation to the breast frequently causes the woman with a deformity of the breast to devaluate herself and shun society, producing a depression which may, in some instances, reach the point of personality change. The streamlined female figure is impressed upon the female consciousness by the cinema, advertising and fiction. Often married women, through repeated pregnancies or increasing adiposis, recognize the unattractiveness of their forms and fear its effect upon their mates, often with justifiable anxiety.

In spite of the profound influence exerted by conspicuous deformity of the breast upon health and daily living, many in the medical profession hesitate to advise or even mention mastoplasty. Physicians who would consider themselves derelict in their duty if they did not attempt the correction of clubfoot take a negative attitude toward mammary deformity, which produces an equally adverse effect upon the normal patterns of life.

Contraindications.—Surgical treatment of mammary deformity should not be undertaken before the breasts have become stationary in size, nor should it be attempted so late in life that senescence jeopardizes the end result. Any physiologic or pathologic condition which might induce complications or delay healing must be considered and may contraindicate mastopexy. It is, of course, axiomatic that any suspected metaplastic change or existing malignant disease in the breast is a contraindication. Pregnancy and lacta-

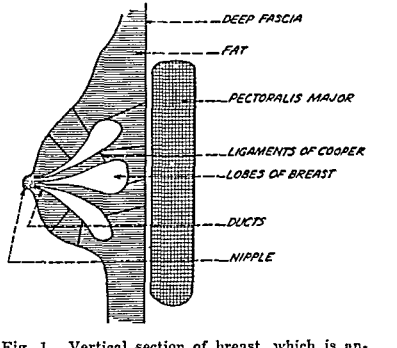


Fig. 1.—Vertical section of breast, which is anchored to the overlying skin and the underlying pectoral fascia by bands of fibrous tissue called the ligaments of Cooper. (*Reproduced from A. Lee McGregor's "A C[illegible] of S[illegible]tomy," by John Wright [illegible], I*

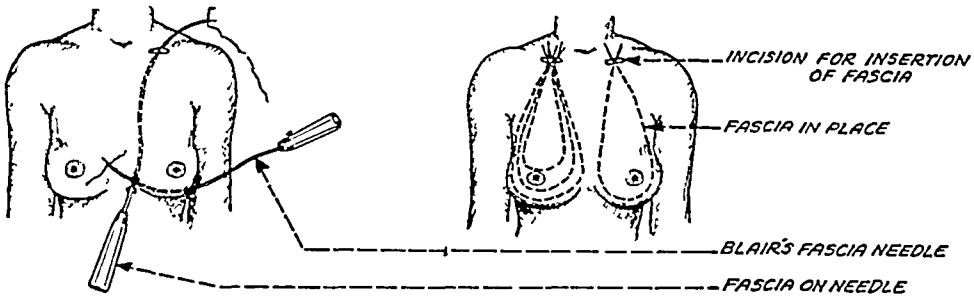


Fig. 2.—Method of insertion of the fascia. The empty fascia needle is inserted through a small opening, going through the subcutaneous tissue to the opening below the clavicle. The fascia is threaded on the needle and pulled through. This maneuver is repeated until the loop of fascia is inserted. From two to four strips of fascia are found necessary, varying with the condition present.

tion contraindicate operation on the breasts, and the breasts should be dry for approximately six months before any mastoplastic procedure is attempted. Future lactational function, however, is conserved after the method of mastopexy to be described. Psychic factors, in an emotionally unstable person, may also be contraindicative, or may dissuade the surgeon from performing the operation. Of course, each individual candidate for a mastoplastic reconstructive operation on a purely elective basis must be evaluated.

To the reconstructive surgeon the morphologic classification is probably the most important and may be placed in four main categories: (1) ptosis with an atrophic normal or a slightly enlarged gland; (2) ptosis with moderate hypertrophy; (3) ptosis with massive hypertrophy, and (4) asymmetry.

The primary objectives in a mastoplastic procedure for raising the ptosed, hypotrophic breast should be: (1) preservation of function; (2) good cosmetic and esthetic end results as to contour and symmetry of the repaired breast; (3) a minimum of disturbance to tissues and vascularity, and (4) a repair with a high degree of permanence.

Mastopexy.—In patients with hypotrophic and ptosed breasts the overstretched skin and its unelastic supportive structures cannot be relied upon to provide durable mastopexy. For a lasting effect the breast must be fixed to the pectoral muscle with strong nonabsorbable suspension material. Fascia lata is an excellent material for this purpose. I am strongly convinced that implantation of any foreign material into the breast, such as homografts or preserved tendons, should be discouraged.

As has been stated, the subcutaneous insertion of fascia lata has been amply demonstrated in practically every branch of surgery. Kirschner[10] reported the use of live fascia in 150 patients. Davis[11] and Lewis and Davis[12] also published reports on the subject.

Gallie and LeMesurier,[13] in a series of experiments on rabbits, used patches of

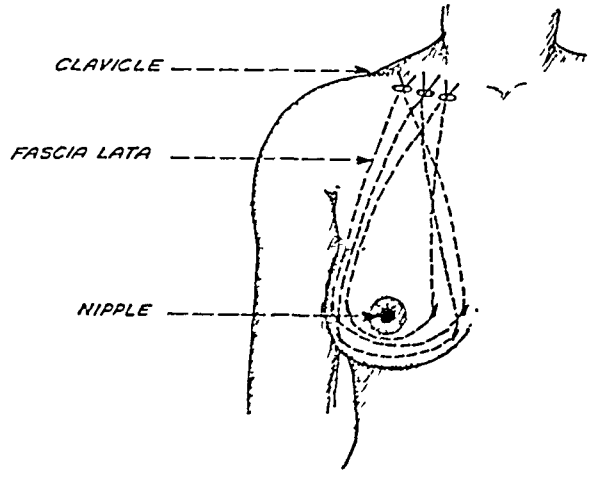


Fig. 3.—The fascia lata inserted.

fascia, tendon and aponeurosis, and concluded that these connective tissues retain their viability when transplanted. They observed that, during the first few weeks, the ordinary phenomena of inflammation are present. First there is enlargement of the blood vessels with a surrounding plastic exudate. Then a thin film of capillaries and fibroblasts surrounds the graft. This layer thickens and finally develops into a mass of spindle-shaped cells and fibers. During this interval the transplant remains alive and shows little change beyond moderate edema. After the third week the inflammatory reaction gradually subsides. In specimens recovered as late as one year after transplantation, there is nothing present microscopically to indicate that the cells and fibers have changed in any way, or that their physiologic value has been influenced by transplantation. Necrosis is sometimes present in the deeper portions.

Fascia lata is easily obtained in almost any desired quantity, can be removed without impairment of function and is easy to manipulate. When transplanted, it accommodates itself to the adjacent structures even under unfavorable conditions. It is resistant to infection; is able to obtain sufficient nutrition from the surrounding lymph spaces to retain its viability until new circulation is established; tends to maintain its original structure, and resists absorption. Also, because of its firmness and toughness, it holds sutures and withstands great strain. When great strength is desired, fascia lata is the fascia of choice. Gratz,[14] in a study of the tensile strength and elasticity of fascia lata, found the breaking tension in a strip 1/64 and 1/32 inch thick and 3/8 inch wide to be 55 pounds (24.9 Kg.).

Technic.—The fascial strips are taken from the iliotibial band of the fascia lata of the patient, by the Masson technic,[15] which employs an instrument made of two steel tubes, one slightly longer than the other, with a handle at one end and an opening close to the other, and fitting in-

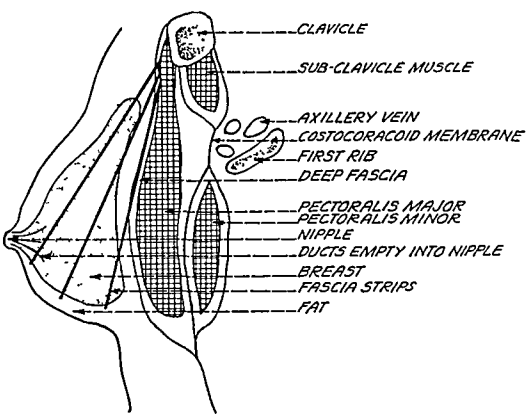
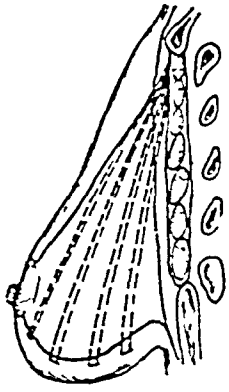


Fig 4.—Lateral view showing fascial strips in place (*Reproduced from A. Lee McGregor's "A Synopsis of Surgical Anatomy," John Wright & Sons Ltd, Bristol*)

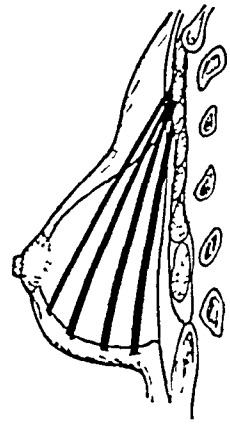
side the other tube. The outer tube has a cutting edge at its lower end. After freeing up, through a small incision on the outer aspect of the lower thigh, a small freed strip is inserted through the opening in the end of the stripper, and by careful manipulation the strip is freed to the area just below the greater trochanter. A piece of fascia is obtained, sufficiently wide to make as many strips as necessary. The cutting end of the outer tube is used to cut the strip free.

Two or more fascia strips 2 to 3 mm. wide, to give sufficient length to make one loop, are fastened together. One end of he loop will be fixed in the deep fascia over the pectoral muscle, just below and in the middle portion of the clavicle, while the other will engage the tissues of the breast. A needle trocar devised by Blair[16] is satisfactory. The needle enters through a small opening in the skin, immediately below and near the midthird of the clavicle, engaging the deep fascia over the pectoralis major muscle. One end of the strip of fascia is now locked in the needle and the needle is withdrawn, leaving an inch or more of the strip protruding at the original puncture. Disengaging the strip, the needle reenters a skin opening, traversing a route through the subcutaneous tissue between the skin and glandular tissue of the breast, beginning at the lower inner quadrant of the breast about 3 cm. anterior to the mammary fold. The needle moves upward, emerges from the original breast opening to grasp the remaining end of the fascia, and is drawn down through the subcutaneous tissue to the opening, medial and at the inner quadrant. Another stab wound is made on the outer quadrant. The needle is inserted to emerge from the wound at the inner angle, grasping the end of the fascia and withdrawing the strip to emerge at the outer edge. This maneuver is repeated to emerge from the original opening at the clavicle.

Two to four loops of fascia have been found necessary for the average ptosis of the breast. The strips are placed about 2 to 3 cm. apart, each 2 to 3 cm. anterior to its fellow. When the fascia is inserted, fixation of the free ends is obtained as follows: The two free ends of the loops that emerge from the same skin opening are forcefully drawn upon, and the proper length of the loop is estimated and then checked by grasping the two strands with



ATROPHY OF GLANDULAR TISSUE, CAUSING DROOPING OF THE BREAST DUE TO RELAXATION OF LIGAMENTS



SAME GLAND AFTER INSERTION OF FASCIA LATA STRIPS.

Fig. 5—Diagrammatic drawings, showing breast before and after the insertion of fascia lata.

Fig. 6.—Photographs of breast before (*above*) and after (*below*) insertion of fascia lata for ptosis.

Halsted forceps and relaxing the pull. The proper length of the loop having been determined, the strands are sutured together at this point and the ends buried in the tissues. As in other types of fascial suture, each stitch engages but part of the thickness of the strand. Fine silk sutures are used. The strip of fascia, when in place, should be sufficiently short to cause noticeable overcorrection.

Immediately after implantation of the fascia and suturing of the skin openings, all strain is taken off the newly implanted fascia by drawing the breast into a position of overcorrection and maintaining this by means of dressings that place the weight of the breast upon the shoulders. These dressings are left in place for about two weeks.

Advantages.—Several elements of the technic of operation described, in my opinion, are sufficient to warrant serious consideration of this procedure as an important mastoplastic method. For example, the simplicity of the technic and the ease of performance are great advantages. Another primary factor giving merit to the procedure is that the gland is raised to a normal position from above, with no physiologic disturbance to the mammary tissues and nerves.

Furthermore, as can be seen, the nipple and surrounding areola and subareola are not detached; this obviates any need for fenestration or other manipulation or disturbance of its deep nerve supply that would interfere with the normal tactile sensibility of the nipple.

Still another advantage of this technic is the lack of disturbance of the arterial or the venous blood supply and the possibility of necrosis caused by interference with vascularity. Also, the incisions, in the form of small stab wounds at the side and underportion of the breast, are easily and well concealed.

As to the permanence of reconstruction by this method, if one takes the success attained with autografting on various parts of the body as the criterion for the lasting qualities of fascia lata, it seems logical to assume that its use in mammary deformities should be equally affective.

COMMENT

For patients with deformities of the breast aside from a ptotic nipple and small flabby breasts, some form of excision and skin resection is necessary. The flabby pendulous breasts are found most generally in asthenic women, some of whom may not have lactated. The pronounced form of this type of breast has shown a thin stretched flabby skin sac, at the bottom of which is contained a globular-formed, flabby, glandular parenchyma, with a small amount of fat.

I agree with the opinion of Maliniac[18] as to free grafting of the nipple. He stated that, in patients upon whom he has employed free grafting of the nipple, papillary sensitivity and contractibility have been greatly reduced or destroyed. With the transposition technic, however, Maliniac reported an 80 per cent recurrence of normal mammillary sensitivity. The problem of desensitization, as has been pointed out, is entirely eliminated with the method of mastopexy here described.

In performing mastopexy for raising and improving the contour of small flabby breasts, I sometimes employ transplants of autogenous fat. If desired, this procedure can be satisfactorily employed in conjunction with the technic of fascia lata transplant.

SUMMARY AND CONCLUSIONS

A method of mastopexy for reparative support of the ptosed and hypotrophic breast, employing the use of fascia lata, is described. The author has found the particular technic highly satisfactory, and the normal conical form of the raised breast and location of the nipple have been achieved with minimal morbidity.

Although the method is a good one, the technic is still new, and the author has had the opportunity to follow up his patients for two years only. Nevertheless, the safety factors and other advantages enumerated indicate it to be a mastoplastic procedure of merit for reconstruction of the hypotrophic breast, and it can be anticipated that time will prove its lasting qualities.

RÉSUMÉ ET CONCLUSIONS

Une méthode de mastopexie pour la ptose des seins et pour les seins hypertrophiés, par l'emploi de fascia lata, est décrite. L'auteur a constaté que cette technique était hautement satisfaisante; la forme conique normale du sein remonté, ainsi que la bonne situation du mammelon ont pu être obtenus avec un minimum de complications.

Bien que la méthode soit bonne, la technique est encore nouvelle, et l'auteur n'a pu suivre ses opérées que depuis deux ans. Cependant les facteurs de sécurité, ajoutés à d'autres avantages énumérés ici, font de cette opération une plastique mammaire de valeur, et il est probable que le temps confirmera ses avantages.

CONCLUSIONI RIASSUNTIVE

Viene descritto un metodo dimastopessia per la cura delle mammelle ptosiche e ipotrofiche, consistente nell'impiego della

fascia lata Questa tecnica ha dato risultati soddisfacenti e consente di ottenere mammelle ben rialzate, di forma conica e con capezzolo in perfetta posizione, e ciò con minimi inconvenienti

Benchè il metodo sia buono, esso è ancora troppo recente, e l'autore ha potuto controllarne i risultati a distanza per due anni soltanto Ritiene nondimeno che questo tipo di mastoplastica sia ideale

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Es wird ein Verfahren der Mastopexie zur Fixierung der hangenden und hypotrophischen Brust unter Verwendung der Fascia lata beschrieben Der Verfasser ist mit den Erfolgen dieser besonderen Technik hochst zufrieden Es ist ihm gelungen, der gehobenen Brust eine normale kegelformige Gestalt zu verleihen, und eine normale Lage der Brustwarze zu erzielen mit einem minimalen Grad von Morbidität

So gut das Verfahren ist, so ist es doch noch neu, und der Verfasser hat seine Patientinnen fur nicht langer als zwei Jahre beobachten konnen Trotzdem weisen die dem Verfahren eigenen Sicherheitsfaktoren und andere in der Arbeit angefuhrte Vorzuge darauf hin, dass es sich um eine Technik handelt, die ihre Verdienste um die Umgestaltung der Hangebrust hat, und man darf erwarten, dass die Zeit die Dauerhaftigkeit der Erfolge beweisen wird

SUMARIO E CONCLUSOES

Um metodo de mastopexia para o reparo de levantamento de queda do seio e seio hipotrofico, *empregando se o fascia lata*, e descrito O autor achou essa técnica particular altamente satisfatória, e a forma cônica normal do seio levantado e local do mamilo, foram conseguidos com um mínimo de morbidade

Embora o metodo seja bom, a ténica ainda e nova, e o autor teve a oportunidade de acompanhar os pacientes por dois anos apenas Não obstante, os fatores de segurança e outras vantagens enumeradas indicam que e um metodo mastoplastico de valor para a reconstrução de um seio hipotrófico, e pode-se antecipar que o tempo provara suas qualidades duradouras

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Fracture Expansion of the Maxillae for the Treatment of Alveolar Collapse in Patients with Cleft Palate*

WILLIAM MILTON ADAMS, M.D.

MEMPHIS, TENNESSEE

ALVEOLAR collapse, which gives rise to extreme malocclusion, is a complication observed in patients with cleft palate. It is most frequently encountered in patients who have undergone extensive operative procedures for closure of the hard palate, but it is not infrequent in patients with bilateral harelip and cleft palate. In the latter, the premaxilla remains in a forward position and the posterior maxillary segments fall or collapse behind the premaxilla. For patients with bilateral harelip and cleft palate, many operative procedures have been proposed to avoid this complication. A widely held view is that the premaxilla should be excised at an early age, but in my own experience this procedure has given unsatisfactory results. Shaving the medial borders of the premaxilla and the posterior maxillary segments at a time when they are in approximate apposition is the best means of preventing alveolar collapse. Correction of this complication by orthodontists has been universally unsatisfactory. The orthodontist can accomplish only minor improvement by changing the position of the teeth in the alveolar arch or by compromising with an overlay prosthesis, extraction and full dentures. In short, the management of the collapsed alveolar arch is one of the most difficult problems in the entire field of surgical therapy of the cleft palate.

The following technic, which is referred to as fracture expansion of the maxillae, is offered as a means of correcting extreme degrees of alveolar collapse. It is indicated for all patients who fail to show improvement as a result of more conservative methods. The principle embodied in the technic is the creation of a bilateral complete horizontal fracture of the maxillae, plus a vertical fracture through the site of the old cleft in the hard palate. This procedure facilitates a lateral shift of the maxillae to any desired position. A self-retaining orthodontic splint is then employed to immobilize the repositioned segments.

Prior to the date of operation, the orthodontist takes impressions and makes "study models" of the upper and lower teeth. The impression model and the upper arch are sectioned in the midline to allow the teeth of the upper and lower arches to occlude properly. Plaster of paris is then added to the upper model for fixation in the proper position. From this model a self-retaining orthodontic splint is made to fit the repositioned segments of the upper arch so as to afford proper occlusion with the lower arch. Metal orthodontic bands are then placed on the molars

From the Department of Plastic Surgery, University of Tennessee Medical School, Memphis.

Read at the Twentieth Anniversary Meeting of the International College of Surgeons, Geneva, Switzerland, May 27, 1957.

*This method of treatment of the extremely underdeveloped palate and dental arch has been carried out with the cooperation of Drs. Faustin N. Weber and Ralph E. Braden, orthodontists, Memphis, Tennessee, and Drs. Thomas H. Shipmon, Jr., and Cecil L. Reines, prosthodontists, Memphis, Tennessee.

Submitted for publication Feb. 14, 1958.

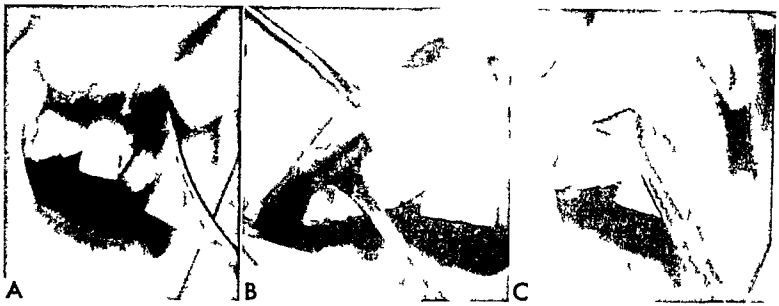

Fig 1 —*A*, osteotome in a position to obtain fracture through the midline of the hard palate (This corresponds to *1* in Figure 2) *B* osteotome in a position to obtain a fracture below the attachment of the base of the malar bone (This corresponds to *2* in Figure 2) *C*, osteotome is in a position to obtain a fracture in the region of the piriform angle This corresponds to *3* in Figure 2

of the upper arch for attachment of this appliance at the time of operation

The first step in the surgical procedure is the recreation of the cleft of the hard palate

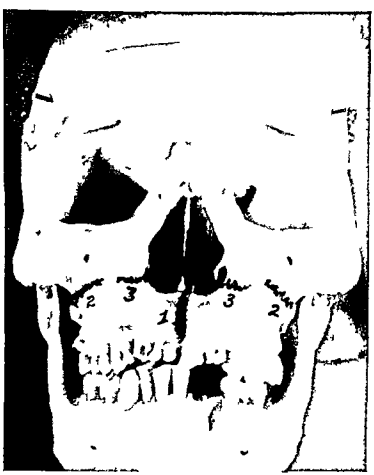

Fig 2 —Photograph of a skull showing the lines along which surgical fractures are created in order to facilitate a shift of the right and the left maxilla laterally

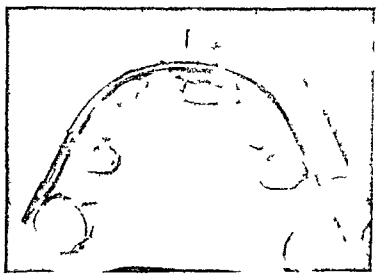

Fig 3 —Self retaining orthodontic splint made to fit the repositioned segments of the upper arch

with the use of a ½ inch (1 2 cm) osteotome (Fig 1 *A*, *B* and *C*) After this fracture has been created it is sometimes possible to spread the right and left maxillae laterally a few millimeters by applying force, but upon release of this force the maxillae will immediately spring back into their previous position At this stage of the procedure, the point of attachment of the base of the malar bone is fractured with a 1-inch osteotome (Figs 1 and 2) If any difficulty is encountered in shifting the maxillae laterally, a ⅛ inch osteotome is inser he anterior up sulcus at

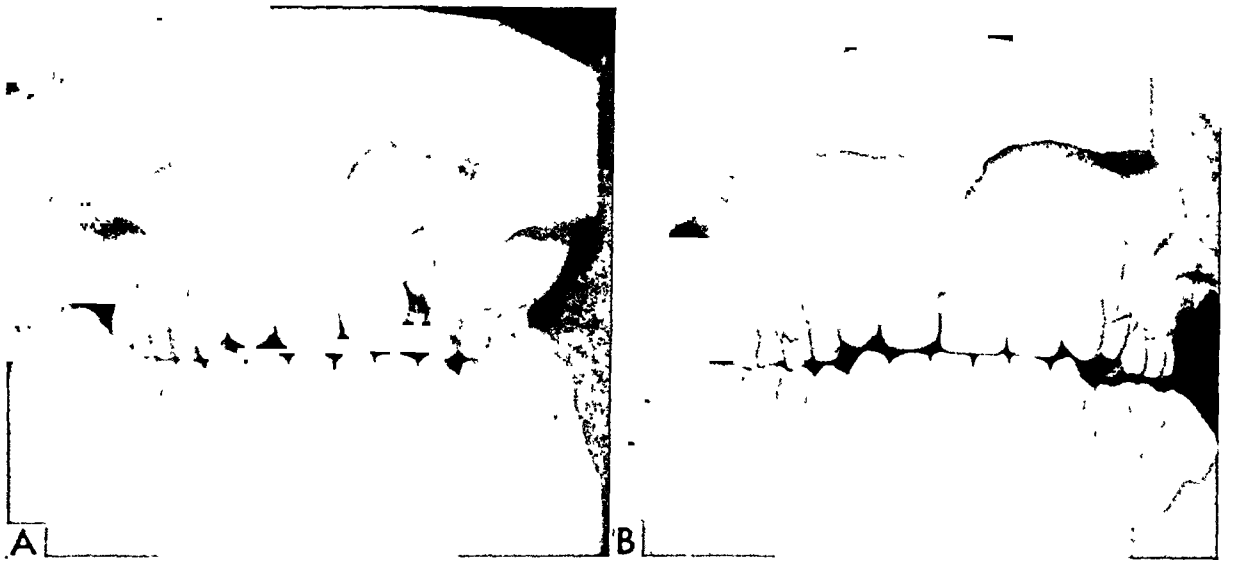

Fig. 4.—*A*, preoperative study model of the maxillae of a white girl 13 years old. The collapse of the posterior maxillary segment is quite apparent. There is extreme narrowing of the upper dental arch, which results in poor occlusion. *B*, postoperative study model (same patient). A permanent prosthesis is in place, and there is proper occlusion of the upper and dental arches.

the piriform angle and is directed posteriorly just above the floor of the nasal cavity (Figs. 1 and 2). After section of the maxillae at the piriform angle, it is possible to reposition the right and left maxillae to permit application of the previously constructed orthodontic splint into the sleeves of the metal orthodontic bands (Fig. 3). The surgical wound in the midline of the palate is packed with petrolatum iodoform gauze. The wounds of the mucous membrane in the upper sulcus are left unsutured. The orthodontic self-retaining splint is worn for two or three months, during which time the orthodontist may carry out other corrective procedures for improving the position of individual teeth. After completion of the orthodontic treatment, the patient is referred to the prosthodontist for construction of a permanent prosthesis to replace any missing teeth, to maintain the proper position of the maxillae, to provide fullness and more normal contour to the upper lip and to close any cleft of the hard palate.

This procedure has been carried out on 7 patients with complete cleft lip and cleft palate, all of whom presented evidence of extreme underdevelopment of the maxillae with marked collapse of the upper dental arch. In conjunction with orthodontia and prosthodontia, dramatic improvement in function and appearance has been obtained in each case.

SUMMARY

Alveolar collapse, which gives rise to extreme malocclusion, is observed in patients with cleft palate. It is most frequently encountered in persons who have undergone operative treatment for closure of the hard palate, but it is not uncommon associated with bilateral harelip and cleft palate. Management of the collapsed alveolar arch is one of the most difficult of all problems connected with the surgical treatment of these anomalies.

The author presents a technic of maxillary fracture expansion for the treatment of alveolar collapse in patients with cleft palate. Alveolar collapse in such patients causes extreme malocclusion. The ortho-

dontist can accomplish only minor improvement by changing the position of the teeth in the alveolar arch or by compromising with an overlay prosthesis, with extraction and full dentures The principle of the technic advocated by the author is the creation of a complete bilateral horizontal fracture of the maxillae, plus a vertical fracture through the site of the old cleft in the hard palate This facilitates a lateral shift of the maxillae to any desired position A self-retaining orthodontic splint is then employed for immobilization

The operation has been performed on 7 patients, in conjunction with orthodontic and prosthodontic measures All of the patients showed dramatic improvement in function

RIASSUNTO

L'autore descrive una tecnica di frattura mascellare per la cura del collasso alveolare nei pazienti con palatoschisi Il collasso alveolare e la causa principale della malocclusione, e l'ortodonzia puo far poco contro di esso con la semplice modificazione della posizione di essi nell'alveolo o con protesi

Secondo la tecnica descritta si viene a creare una frattura orizzontale bilaterale e completa della mandibola, oltre ad una frattura verticale attraverso la fenditura del palato duro Cio facilita lo spostamento laterale della mandibola fino alla posizione desiderata, si usa, poi, un apparecchio per l'immobilizzazione

Questo intervento e stato usato in 7 casi, in associazione aprovvedimenti di ortodonzia e prostodonzia In tutti i casi si ottenne un grande miglioramento della funzione

RESUMÉ

L'auteur décrit une technique de fracture maxillaire etendue pour le traitement de l'effondrement alveolaire chez les malades atteints de fissure du palais L'effondrement provoque dans ces cas une malocclusion prononcee L'orthodontiste ne peut obtenir qu'une amelioration minime par la modification de la position des dents dans l'arc alveolaire, ou au moyen d'une prothese complète apres extraction Le principe de la technique recommandee par l'auteur consiste a provoquer une fracture maxillaire horizontale bilaterale, completee par une fracture verticale au travers du lieu de l'ancienne fente du palais Cette façon de proceder facilite une deviation laterale des maxillaires dans le position desiree Une attelle orthodontique se maintenant d'elle-même est ensuite appliquee pour l'immobilisation

Cette operation a ete pratiquee dans sept cas, accompagnee de mesures orthodontiques et post-orthodontiques Elle a toujours ete suivie d'une amelioration fonctionnelle spectaculaire

ZUSAMMENFASSUNG

Zur Behandlung des Kollapses des Alveolarbogens in Fallen von Wolfsrachen legt der Verfasser eine Technik der Durchbrechung und Erweiterung des Oberkiefers vor Der Alveolarkollaps fuhrt bei diesen Kranken zu hochgradiger fehlerhafter Okklusion Durch Anderung der Stellung der Zahne im Alveolarbogen oder durch eine behelfsmassige Losung mit einer Überlagerungsprothese, Zahnextraktionen und doppelter Prothese kann der Orthodont nur geringe Besserungen des Zustands erzielen Der Grnudsatz der vom Verfasser empfohlenen Technik besteht in der Schaffung eines vollstandigen doppelseitigen horizontalen Oberkieferbruches und eines vertikalen Bruches durch die Stelle der alten Spaltbildung im harten Gaumen Dies ermoglicht eine seitliche Verschiebung des Oberkiefers in die gewunschte Stellung Zur Immobilisierung wird dann eine selbsthaltende orthodontische Schiene verwandt

Die Operation ist in Verbindung mit orthodontischen und prothetischen Massnahmen an sieben Patienten ausgeführt worden. Alle liessen eine eindrucksvolle Verbesserung der Funktion erkennen.

SUMARIO

O autor apresenta a ténica de expansão da fratura maxilar para o tratamento do colápso alveolar em pacientes com guela de lôbo. O colápso alveolar em tais pacientes causa extrema mal oclusão. O ortodontista pode conseguir apenas ligeira melhora pela mudança de posição dos dentes no arco alveolar ou com um envóltório de próstese, com extração e dentaduras completas. O princípio da técnica advogada pelo autor é a creação de uma fratura horizontal bilateral completa do maxilar, mais uma fratura vertical através da local da antiga fenda no palatino duro. Isto facilita uma mudança lateral do maxilar para qualquer posição desejada. Uma tala ortodôntica é então empregada para imobilização.

A operação foi feita em 7 pacientes, juntamente com medidas ortodônticas e prostodônticas. Todos os pacientes apresentaram dramática melhora na função.

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Carcinoma of the Rectum as a Focus of Salmonella Barielly Infection

Report of a Case

RUDOLPH J PATRIZIO, B S, M D, A I C S
MUNCY, PENNSYLVANIA

ON Feb 28, 1952, F W, a man aged 55, came to me complaining of recurrent episodes of diarrhea since September 1951, accompanied by bleeding, colic and occasional chills The oral temperature was 99 6 F

Examination gave negative results except for slight tenderness across the lower part of the abdomen Owing to the history of chills and the fact that there were several cases of bacillary dysentery in the area at the time, it was decided to obtain a stool culture The culture revealed S barielly The patient was given a course of sulfasuxidine and obtained temporary relief of symptoms Follow-up cultures remaining positive, a course of chloromycetin was given Two follow-up cultures were then negative, and the patient was not heard from for two months Owing to intermittent recurrence of symptoms, he returned to me on June 20, and another culture was taken, which was positive In view of the persistence of the symptoms, however, it was decided to hospitalize the patient and to do more thorough studies Barium roentgen studies of the colon revealed a filling defect at the rectosigmoid juncture On sigmoidoscopic study a growth was observed in this region A biopsy was performed, and the tumor was reported to be an adenocarcinoma On August 5, abdominoperineal resection of the distal portion of the sigmoid and the rectum was performed The patient's convalescence was uneventful Cultures of the stool on September 4 and 24 and on October 30 were reported negative

COMMENT

Perusal of the literature in the bibliography, which contains all the pertinent references appearing in the *Quarterly Cumulative Index Medicus* for the past twenty-five years, fails to reveal any case of bacillary dysentery propagated in a malignant growth of the alimentary canal The literature is replete with cases of amebic colitis, ulcerative colitis and polyposis masking carcinoma of the large bowel or possibly acting as an etiologic factor Many cases in which an amebic granuloma was mistakenly resected as a malignant growth of the alimentary tract are reported Gray reported a case of Salmonella suipestifer infection associated with an abscess in myomas of the uterus Graham and Coleman reported a case of Salmonella infection in a metastatic carcinoma of the proximal third of the humerus

To me this case is interesting because a

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carrier state was apparently incubated in a carcinoma of the rectosigmoid that was resistant to intensive therapy. After resection of the tumor the carrier state was cured. It is evident that one must exhaust all diagnostic possibilities before making a diagnosis of simple intestinal parasitic carrier state. One must have a high index of suspicion.

SUMMARY

An unusual case of carcinoma of the rectum is reported, in which the tumor served as an incubating medium for Salmonella bariel'y infection. After resection of the tumor, the "carrier state" was cured. Since this carcinoma was discovered in the investigation of an intestinal infection, the author points out that "one must exhaust all diagnostic possibilities before making a diagnosis of a simple intestinal parasitic carrier state."

RÉSUMÉ

On raporte un cas rare de carcinome du rectum, dans lequel la tumeur sert comme le moyen d'incubation pour l'infection de Salmonella Barielly.

Après la resection de "l'état porteur," la tumeur fut guerie. Cette carcinome a été découverte pendant une investigation d'infection intestinale.

L'auteur discute le traitement et insiste sur la valeur d'une diagnose soigneuse.

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Orthodoxy . . . is the essential basis of civilisation. and the real difficulty is to prevent orthodoxy passing into stagnation. to devise machinery for discarding theories that have ceased to accord with modern views. and practices that have ceased to have value: in short. for ensuring that the heterodox is heard. tested, and. if approved. admitted to the body of the orthodox.

—*Ogilvie*

Bronchopleural Fistula

CHIN BURANADHARM, M.D.
AND
SMARN MUNTARBHORN, F.I.C.S., F.R.C.S. (Eng.), M.B.B.S. (Lond.)
BANGKOK, THAILAND

THE persistence of a communication between the bronchial tree and the pleural cavity after pneumonia and pulmonary abscess, in the present day of antibiotics, has become a rare event. Attention to this abnormal channel in recent years has been directed mostly toward the postoperative type, which is an unpleasant complication of resection of the lung for pulmonary tuberculosis. More heed should be paid, however, to the bronchopleural fistula naturally occurring as a result of chronic infection, which is most significantly disabling. The chronicity of this condition over a period of years is associated with chronic ill health, anemia, retardation of growth (especially in children), collapse of the thoracic wall, scoliosis and advanced clubbing of the fingers and toes. These disabling features are preventable, provided that diagnosis of the fistula is made in an early stage. It is therefore desirable that, in the absence of tuberculosis, the cases of patients with chronic empyema who make no further improvement a month after drainage should be reviewed, with the possibility in mind that a bronchopleural fistula may exist.

Pathogenesis.—Trauma is a significant cause of this condition. In fact, all penetrating wounds of the chest carry the potentiality of chronic empyema. It has been reported that in half of the cases of chronic empyema resulting from such cause the empyema was associated with a bronchopleural fistula (Muntarbhorn, 1949).

Chronic empyema or pulmonary abscess may rupture into the bronchus or into the pleural cavity, and the sudden spread of pus is often recognized when a chill or a sudden rise in the temperature occurs and is followed by profuse expectoration and alleviation of symptoms.

Two children (Fig. 1) were seen with empyema necessitans draining through the anterior chest wall (sixth space), which had been present for six and seven years respectively. This condition should be always suspected of indicating an underlying fistula.

Acute or chronic amebic abscess of the liver may rupture into the pleural cavity or, less commonly, into the bronchus as well as the pleural cavity, thus producing a bronchopleural and a bronchohepatic fistula as illustrated (Cases 11 and 12; see table).

Pathologic Picture.—Marked pathologic changes are observed in the lung and in the wall of the empyema cavity, but the most outstanding features of all is the severe clubbing of the fingers and toes, which is a most constant accompanying condition.

Read at the Congress of the Thailand Section of the International College of Surgeons, Don Muang Air Force Hospital, Bangkok, May 25, 1956.
Submitted for publication June 29, 1956

1. The chronic sepsis produces a parenchymatous change, with varying degrees of fibrosis, and in cases of multiple abscess much of the lung tissue is destroyed. Atelectasis may also be present.

2. Both layers of the pleura become thickened, and an additional layer of fibrous tissue, the "pseudopleura," is formed inside as a lining for the empyema cavity. The pseudopleura and the pleura proper together may be as thick as 10 mm., and in a case of long standing calcification will probably take place. It is this layer of pseudopleura that has to be peeled off in the process of decortication.

3. In the course of nature's attempt to heal, narrowing of the intercostal spaces and collapse of the chest will take place, resulting in well-developed compensatory scoliosis and a lopsided gait.

Associated with the chronic infection and hypoxia are well-marked clubbing of the fingers and toes, anemia and retardation of growth.

Clinical Picture.—There is often a history of a febrile attack associated with chronic and purulent expectoration; tightness of the chest is common. A chill and fever in 2 cases in this series indicated deep-seated infection and rupture of the abscess, which is usually followed by profuse expectoration. Albuminuria was noted in 1 case.

Fig. 1.—*A*, boy aged 11 years with empyema necessitans, with a bronchopleurodermal fistula through the sixth interspace of six years' duration. Note 2 plus clubbing of fingers and toes. *B*, girl aged 5 years with chronic bronchopleural fistula of two years' duration, awaiting resection. Note typical lopsided stance (this applies also to the gait).

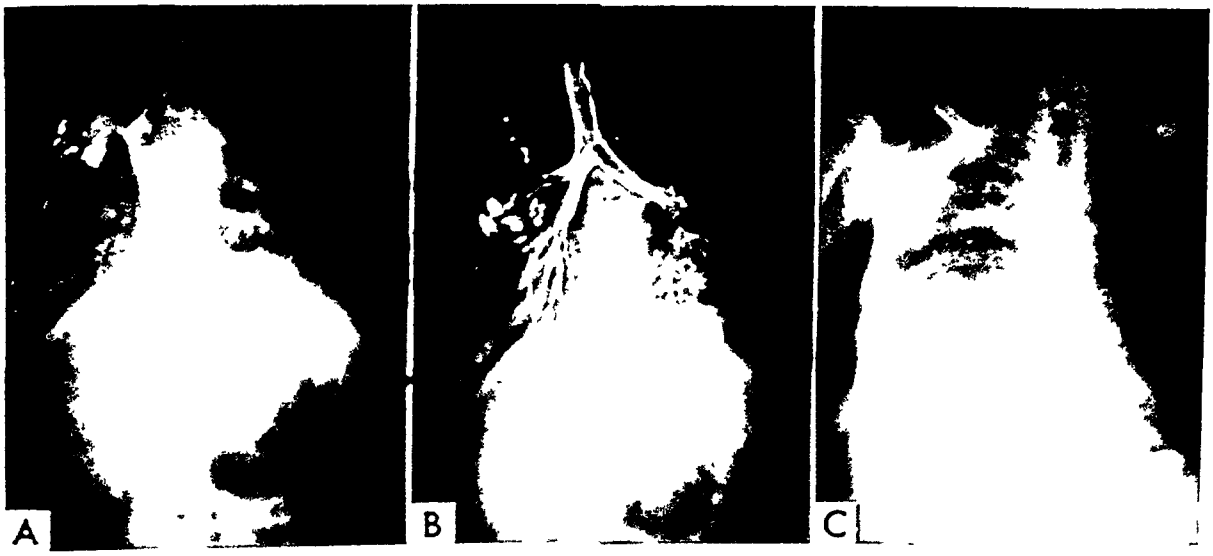

Fig. 2.—*A* (Case 5), lipiodol from bronchus of right upper pulmonary lobe passes into empyema cavity. Scoliosis (2 plus) is present. *B* (same case), traction esophageal diverticulum visualized after patient had swallowed lipiodol. Completely healed after resection of left upper lobe and diverticulectomy. *C* (Case 12), dionosil in lung, coughed up after being injected into amebic liver abscess (bronchopleural), healed after drainage for one month.

Special Investigation —A plain roentgenogram will show thickened pleura, collapse of the thoracic wall, deviation of the trachea and scoliosis

In our cases, pus and sputum from the patients showed staphylococci, B pyocyanea, B typhosus and diplococci, but no ameba was encountered

In order to clinch the diagnosis of bronchopleural fistula, the following evidence is essential

The pus aspirated from the empyema cavity should be similar to the expectorated pus in both color and consistency

If 5 cc of 0 8 per cent indigo carmine is injected into the pleural cavity, the blue discoloration should be seen in the sputum within five or ten minutes

After closed drainage, air continues to bubble through the underwater tube, this is exaggerated by coughing

A bronchogram may demonstrate a track, or the lipiodol may be seen in the empyema cavity

In addition, a manometric method is sometimes adopted, it is more tedious and less certain than the other methods mentioned In a case of bronchopleural fistula, if air is aspirated from the cavity, the pressure will remain the same Also, in the analysis of a specimen of gas from the cavity, if a bronchopleural fistula is present the oxygen and carbon dioxide levels are more or less the same as those of the atmosphere, whereas in a closed cavity the oxygen level is lower and the carbon dioxide level is higher

Treatment —In every case of nontuberculous chronic empyema, underwater drainage must be done as soon as possible If a bronchopleural fistula is present, air will bubble through constantly, making the diagnosis more certain After the lapse of a month or so some fistulas may close spontaneously (5 out of 11 in this series) and no further surgical measures are required Should the bubbling continue, resection of the lung would be indicated

Many forms of treatment employed in the past can be mentioned with interest, eg, electrocauterization (Friedrich), grafting of muscles with blood supply into the cavity (Alvazanov), excision of the fistula and closure (Sauerbruch), and resection of the lung (Tuffier, Graham and Krause, Graham, Ballon and Singer)

In our 5 cases of pulmonary resection, the following operations were performed

Right upper lobectomy	2
Right lower lobectomy	1
Right middle and lower lobectomy	1
Left lower lobectomy	1
Total	5
Drainage alone	6
Operation refused	1
Total	12

Surgical Considerations —In view of the fact that there are many attendant disabling complications of a chronic bronchopleural fistula, the condition should be always suspected after a penetrating wound, such as a wound due to a stab, a bullet or any penetrating object The condition is amenable to surgical treatment, and early operation wards off the aforementioned complications

Segmental resection has not been the treatment of choice in these cases, as bleeding during the dissection is a major problem Moreover, it is difficult even at operation to determine the extent of the lesion, and lobectomy offers the only possible means of insuring entire removal of the diseased portion

Traction Diverticulum —The patient in Case 5, a boy aged 11, had postpneumonic empyema necessitans with a fistula discharging pus through the sixth intercostal space in the anterior axillary line, a chronic cough wi tu
marked clubbing o
flattening of the rig

Data on Twelve Cases of Bronchopleural Fistula

Patient; Age; Sex	Causes	Duration	Clinical Picture	Organisms	Special Investigations	Treatment	Result
1 Girl 1 5/12 years	Postpneumonic R.	45 days	Temperature, chill, dyspnea; thick pus aspirated	Not stated	Bronchogram; tuberculin test, neg.	1. Aspiration 2. Intercostal drainage 3. R. lower lobectomy	—No improvement —Air bubbled through fistula —Healed 30 days later
2 ♂ 7 years	Postpneumonic R.	1 year	Chronic cough; dyspnea; purulent sputum; no clubbing; scoliosis +	Not stated	Roentgenogram; thickened pleura fluid; air tuberculin, neg.	1. Aspiration 2. R. middle and lower lobectomy; decortication	—No Improvement —Healed 3 weeks later
3 ♂ 10 years	Synpneumonic	8 days	Cough; chest pain; greenish yellow pus; no clubbing	Staph. albus B. typhosus	Bronchogram	1. Aspiration 2. Rib resection; drainage	—No improvement —Healed 1 month later
4 ♀ 11 years	Postpneumonic R.	7 years	Empyema necessitans; 2 openings 6th intercostal space; scoliosis ++; chest flattened; clubbing ++	Staphylococci B. pyocyanea	Bronchogram	R. upper lobectomy	Healed 1 month later
5 ♂ 11 years	Postpneumonic R.	6 years	Empyema necessitans; chronic cough; pus + fistula 6th interspace; scoliosis ++; clubbing ++; collapse of chest wall	Streptococci	Bronchogram; Traction diverticulum	R. upper lobectomy; diverticulectomy	Healed 3 weeks later
6 ♂ 11 years	Postpneumonic L.	2 years	Fever; cough; dyspnea; aspirated many times; puslike sputum; pus aspirated; sediment 95%	Staphylococci	Indigo carmine test, ++	Rib resection; drainage	Healed 1 month later

7 ♂ 47 years	Stab wound R	1 year	Coughed up pus same color as discharge from wound	Staphylococci	X-ray encapsulated fluid	Rib resection, drainage	Healed 3 weeks later
8 ♂ 33 years	Stab wound L	4 years	Sputum showed pus and blood; clubbing +, dropping L. shoulder		Indigo carmine test, ++	Rib resection, drainage, L	Healed 30 days later
9 ♂ 43 years	Bullet wound R	1½ years	Discharge R 2d space; occasional hemoptysis; pus, +	Staphylococci	Bronchogram	Refused operation	
10 ♂ 45 years	Postpneumonic R	10 days	Fever, blood +; pus in sputum; aspirated pus	Diplococci	Indigo carmine test, ++	R lower lobectomy	Died (blood loss)
11 ♂ 10 years	Amebic	2½ months	Heaviness in chest; dyspnea; aspirated 10 times, fluid color of anchovy sauce; blood stained sputum	Amebae not found	Indigo carmine test, ++ Stool no cyst	Rib resection; drainage; antiamebic drugs	Healed 1 month later
12 ♂ 44 years	Amebic	7 days	10 years previously recurrent amebic colitis for 8 years; 7 days fever, pain right side of chest, jaundice; dyspnea; sputum, yellow pus; clubbing +; *Liver* tender, enlarged 4 finger breadths Aspirated fluid; liver abscess, anchovy-color red, sediment 95%	Amebae not found drugs	Injection of dionosil into liver abscess; into lung; coughed up, antiamebic	Rib resection; drainage	Healed

severe scoliosis; streptococcic infection; a tract in the upper lobe as shown on the bronchogram, and traction of the esophagus forming a large esophageal diverticulum to the right, observed after the patient had swallowed lipiodol. After upper lobectomy and diverticulectomy, he made an uneventful recovery.

Results: The results in the 12 cases were as follows:

Treatment	*No. of Cases*	*Results*
Drainage alone	6	Cure
Drainage and later resection of the lung	5	1 death
Operation refused	1	
Total	12	

Five children underwent resection of the lung at the ages of 1½, 7, 10, 10 and 11 respectively. All tolerated the operation amazingly well.

Amebic Empyema and Fistula. — Included in the series of 12 are 2 cases of amebic empyema and fistula. They were due to an amebic abscess of the liver that had ruptured into the lung tissue through the diaphragm. One patient coughed up pus the color of anchovy sauce; after drainage and anti-amebic therapy this cleared up completely. In the other a bronchopleural fistula was revealed after dionosil was injected into the hepatic abscess, after which the radiopaque material was observed in the lung and in the sputum (Fig. 5, Cases 11, 12). This condition cleared up thirty days later.

SUMMARY

Twelve cases of bronchopleural fistula are reported. In children, disabling symptoms are common, and the tetrad is made up of clubbing of the fingers and toes, flattening of the chest wall, scoliosis, and air bubbles through the sinus.

The diagnosis is obtained by means of sputum-and-pus comparison, the indigo carmine test and the bronchogram. The treatment is early drainage, followed, if necessary, by resection of the lung a month later.

Of the 11 patients operated on, 1 died. In the rest, the condition cleared up.

Not infrequently the fistula is due to rupture of an amebic liver abscess into the lung and the bronchial tree, and its prognosis is not a hopeless one.

RÉSUMÉ

Douze cas de fistules bronchopleurales sant décrits. Les déformations sont fréquentes chez l'enfant, et la tétrade est constituée par des doigts et orteils en massue, l'aplatissement de la paroi thoracique, la scoliose, et des bulles d'air dans les sinus.

Le diagnostic est posé par l'examen des crachats et du pus, par l'épreuve de l'indigo-carmin et par le bronchogramme. Le traitement consiste en un drainage précoce suivi, en cas de nécessité, de la résection du poumon un mois plus tard.

Sur il cas traités il y a eu dix guérisons et 1 décès. 11 n'est pas rare que la fistule soit due à la rupture d'un abcès amibien du foie dans le poumon et l'arbre bronchique, dont le pronostic n'est pas dêsepéré.

RIASSUNTO

Vengono riportati dodici casi di fistola bronco-pleurica. Nei bambini la tetrade sintomatica è comune ed è costituita da: dita a bacchetta di tamburo, appiattimento della parete toracica, scoliosi e fuoriuscita di bolle d'aria dal meato fistoloso. La diagnosi si fà coll'esame comparativo dell' escreato e del pus, col test all'indacocarminio e colla broncografia. La cura consiste nella precoce istituzione del drenaggio, seguita, se necessario, dalla resezione polmonare un mese più tardi. Su undici operati si ebbe un morto. Nei rimanenti

si ebbe la guarigione Non raramente la fistola è docuta alla rottura di un asce-sso amebico del fegato nel polmone e nell'albero bronchiale; la prognosi, in tali casi, non è la più favorevole

ZUSAMMENFASSUNG

Es wird uber 12 Falle von bronchopleuraler Fistel berichtet Bei Kindern sind Symptome, die mit starker korperlicher Behinderung einhergehen, haufig

Die Tetralogie der Symptome besteht aus Trommelschlagelfingern und-zehen, Abflachung der Brustwand, Skoliose und Entweichung von Luftblasen durch die Fistel

Die Diagnose wird durch vergleichende Untersuchung von Auswurf und Eiter, durch Indigokarmin-Proben und durch Bronchographie gestellt Die Behandlung besteht in fruhzeitiger Drainierung, wenn notig gefolgt von Resektion der Lunge nach einem Monat

Von den 11 Patienten des Verfassers starb einer Die ubrigen wurden geheilt Nicht selton kommt die Fistel durch Durchbruch eines Amobenabsesses der Leber in die Lunge und den Bronchialbaum zustande, die Prognose ist nicht hoffnungslos

SUMARIO

Doze casos de fistula broncopleural são relatados Em crianças, sintomas deformantes são comuns, e a tetrade é composta de deformação dos dedos da mão e do pé, peito escavado, esocliose e bôlhas de ar através do seio

O diagnóstico é obtido por meio de comparação do catarro e puz, do teste indigocarmin e do broncograma O tratamento consiste na drenagem precoce, seguida, se necessario, pela ressecção de um pulmão um mês depois Dos 11 pacientes operados, 1 morreu No restante, a condição clareou

Não infrequentemente a fistula e devido a rutura do abcesso de um figado amebico no pulmão e arvore bronquial, e seu prognóstico não é desesperador

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The operation of trepanning is very ancient and was seldom performed without great caution A proof of this was given in the early history of Ireland Connor Mac Neassa, King of Ulster, that generous protector of the literati of his day, and contemporary with Julius Ceasar, having his skull fractured in battle, his first surgeon, Finighin, refused to apply the trepan till his safety was guaranteed by the nobles of the country, in case it did not succeed

—*William Wadd, circa 1827*

Topical Chemotherapy for Suppurative Disorders of the Lung, Including Tuberculosis

EDWIN J. GRACE, M.D., F.A.C.S., F.C.C.P., F.I.C.S., D.A.B.

BROOKLYN, NEW YORK

THE purpose of this publication is to describe a form of nonhospitalizing ambulatory treatment of pulmonary tuberculosis and chronic suppurative disorders of the lung with topical chemotherapy. My method of treatment is based on the following principles:

1. Topical application of antibiotics to infected tissue to enhance the bacteriostatic effect of the drugs and diminish emergence of resistance strains.

2. Outpatient treatment of the total patient in an informal group atmosphere, which provides the advantages of a cooperating medical team and an intimate doctor-patient relation.

3. Recognition of the problems of the total patient and attention to all of them, not merely the particular disease.

Since the discovery of antibiotics, efficient agents have been available to destroy pathogens by altering the environment in which the lethal organisms grow. It is not quite so simple as that, however. For a decade bio'ogists and others especially interested in bacterial genetics have constantly warned the medical profession of the danger that resistant bacterial strains will emerge. These early warnings are now being justified by the increasing frequency of strains that are resistant to all of the more commonly used antibiotics. To prevent the development of resistant strains, a combination of synergistic chemotherapeutic agents must be used.

In part, the first impetus to my work with topical chemotherapy was the demonstration by Sir Howard Florey during World War II of the clinical usefulness of penicillin applied topically to infected war wounds. Also contributing to my interest in this mode of treatment of pulmonary tuberculosis was the original work of a research biologist (Vernon Bryson) on the physical and biologic properties of aerosol. This work was done for the Technical Division of the Chemical Warfare Service. The results of the inhalation research on animals and man encouraged me to take part in a clinical investigation, and further studies along these lines were pursued for the Technical Division on a cooperative basis with the College of Physicians and Surgeons of Columbia University and, still later, under contract to the Medical Division of the Chemical Warfare Service.

On the basis of these earlier investigations and the limited experience of the topical use of the Carrel Dakin's solution in World War I, I have developed a technic of direct topical application of antibiotics that has given excellent results. I use a wetting agent (detergent) of low surface tension, which acts as a vehicle to bring the drugs into intimate contact with the infected surfaces of the lesion. In addition, delivering high concentrations of the drugs directly to the site of infection enables me to use smaller doses, in contrast to the high doses necessary to produce satisfactory blood levels after oral or parenteral administration.

In summary, then, the purpose of my therapeutic technic is as follows: By using

a combination of synergistic chemotherapeutic agents the bacteriostatic effect is reinforced, and the emergence of resistant bacterial strains is prevented or retarded If the chemotherapeutic combination is used in a detergent solution, the bacteriostatic agents can be applied directly to the infected tissue in smaller quantities, with successful clinical results

To administer the drugs in a detergent solution topically in the lungs, I deliver the solution in the form of an aerosol (a mist of fine droplets) This aerosol is inhaled by the patient, and the treatment requires clear understanding of the technic and complete cooperation by the patient for the most successful effect

In the first stage of instruction I demonstrate with pictures and show the patient, by doing it myself, how first to exhale all the air from the lungs and then to inhale it deeply so as to inflate the lungs fully with the therapeutic mist Next, I ask the patient to hold his breath, so that this mist, or fog as I describe it to the patient, will be able to settle down in the thousands of small alveoli so as to increase the blood level and make better contact with the diseased portions throughout the lung The possible dizziness associated with hyperventilation by deep breathing is explained as a *harmless phenomenon* Holding of the breath I emphasize in order to gain maximum absorption at the site of the disease and also to increase the blood level systemically and locally (The blood level is further boosted by oral and often intramuscular administration) This aspect of *chemotherapy* is basic, since a large initial therapeutic dose is wanted for short periods For a lethal effect on the pathogen, "get there firstest with the mostest" instead of the therapeutic dribbling of "too little and too late"

After the first two steps, (1) deep inhalation after marked exhalation and (2) holding the breath for the diffusion into all lung parenchyma, I advise (3) slow exhalation through the nose With regard to this last procedure, I always start with complete exhalation and full inhalation via the nasal route in order to aid in clearing up low-grade sinusitis or potential tuberculosis, nasopharyngitis or laryngitis With all forms of pulmonary suppuration, bronchiectasis, lung abscesses, etc , in which almost invariably some chronic sinusitis is present, I insist on two to four *treatments by the nasal route This slow* exhalation of the mist through the nose will produce a double contact with many small infected sinus cells in the tissues of the upper part of the respiratory tract With tuberculosis the nasal route is generally used only for two or three treatments, the oral route then being substituted unless further nasal treatment is otherwise indicated

I have frequently used some practical, homely similes in pulmonary physiologic instruction to show the patient why I wish him to follow my instructions in order to cure his chronic pulmonary disease It is explained that if all the small air pockets of the lung could be opened out and laid flat on the ground, the surface of the lung would be almost the size of a tennis court When the patient breathes in the mist of small particles deeply, it will follow all of the air passages into deep portions of the lungs like a fog Holding the breath increases the efficiency and concentration of the treatment by direct deposit of the mist in the areas of disease The physician's attention to such details as these and his painstaking explanation of all phases of treatment will often mean the difference between success and failure

Application of this therapy requires cooperation of a high order on the part of the patient, and such cooperation can be developed and fostered only in the proper atmosphere I am convinced th reason for the success of my

been the patient-oriented atmosphere of the informal medical group and by the participation of the patient. Here the patient is examined and treated by a group of physicians, but one physician acts as each patient's "family doctor." It is the latter who establishes that patient-doctor relation of confidence and cooperation familiarly ascribed to the "family doctor."

An important aspect of the treatment of a patient is whether his physician is interested in him wholly—as a total human being—or whether he merely represents another case of a particular disease. Physicians who are interested solely in the patient's lungs or gallbladder or sore arm have lost sight of the total patient and his value to the patient is less. With this total view of the patient, the treatment is further supplemented by the customary clinical adjuncts to improve the patient's resistance; removal of areas of focal infection, care of the teeth and an adequate diet, with appropriate medication and nutritional support.

With the therapeutic principle described in this paper I have been mindful of the responsibility to the public health, both to the family of the patient and to the community and can say unhesitatingly that, in spite of the ambulatory procedure, there is no known evidence of a spread of infection from any of these patients or from others whose cases have been reported elsewhere. Some of these family case studies are now nearly a decade old, with at least semiannual follow-ups.

REPORT OF CASES

CASE 1.—A. W., a woman, aged 67, was first seen Oct. 7, 1948, for cough with ½ to 1 cupful of foul, putrid expectoration, which she had had for twenty-five years after an attack of pneumonia. Three operations had been performed elsewhere, without results; in fact, the cough was made worse. The patient had a mild degree of cardiac strain, probably secondary to her overweight; pulmonary sepsis and fibrosis of the right lung, and dental sepsis. After weight reduction and removal of foci of infection, aerosol therapy was instituted (150,000 units of penicillin and 150,000 units of streptomycin, dissolved in 3 cc. of zephiran chloride in aqueous solution 1:5,000, three times daily for four days; 600,000 units of penicillin with 1 Gm. of streptomycin given intramuscularly once a day for four days*).

The patient's symptoms disappeared, and her physical condition remained satisfactory. At the time of writing, eight years later, she still has no cough or expectoration. The excellent result in this case involved more than the mere disappearance of the foul odor; this patient was rehabilitated so that she could enjoy her friends, her family and her grandchildren.

CASE 2.—W. K., *aged 60, was hospitalized in* December 1947 and was treated for pulmonary abscess following pneumonia of the right lower lobe, with a history of chronic cough (minimal bronchiectasis).

This patient had a history of alcoholism, with moderate liver damage, dental sepsis and chronic sinusitis. He had been given antibiotic-aerosol therapy elsewhere but did not improve because he was not breathing the aerosol deep into the lung parenchyma. Instead, he was breathing in a very shallow manner that permitted only a minimal amount of the mist to reach the main pulmonary bronchi. When therapy was administered properly, he promptly improved and made an uneventful recovery. Surgical intervention was not necessary, and in spite of the patient's alcoholism the results of a recent follow-up, nine years after aerosol therapy, are satisfactory.

CASE 3.—R. M., a woman aged 36, was first seen on Feb. 2, 1940, with a history of pulmonary tuberculosis involving the right lung, discovered in 1934. The patient responded satisfactorily to pneumothorax until the end of 1935, when the pleural fluid became infected. A discharge with mixed pleural infection persisted for twelve years. After complete thoracoplasty in 1940 the fistulas remained persistently purulent, with tuberculosis-infected pleura. The sedimentation rate was high, and there was pronounced secondary anemia. In 1941 the value for hemoglobin was 59 per cent.

In October 1946, one chemotherapeutic

*With [illegible]

agent (0.5 Gm. of streptomycin in 3 cc. of aerosol OT 1 per cent) was instilled every three hours into the sinus for ninety-six hours, night and day. The sinus closed promptly and remained so until 1948. The sinus opened again, but in 1950, when a combination of neomycin, penicillin and streptomycin in 200 cc. of zephiran chloride 1:1,000 was instilled into the cavity continuously as a drip for three days, it closed permanently.

I say "closed permanently" because the antitubercular combination used with the detergent makes the origin of a resistant strain or mutant of Mycobacterium tuberculosis relatively impossible bacteriologically. This patient has been under my care for sixteen years. The compression and collapse therapy to which I would have resorted earlier has no place in my initial therapy, and I mention it only to condemn such practices.

CASE 4.—R. P., a woman aged 43, was first seen here in April 1949, with a history of pulmonary tuberculosis for the past eight years. Dental sepsis with marked pyorrhea and root abscess was treated by the topical and systemic use of aureomycin, and this was followed by the inhalation of aureomycin with a detergent solvent for one day; for the next three days penicillin was used with the aerosol. Injections of penicillin, 300,000 units, were given daily for four days.

After the treatment, ten gastric analyses with cultures all gave negative results. An ulceration on the vocal cords disappeared; roentgenograms of the chest were satisfactory. At the time of writing, seven years later, the patient is well and carrying on her active duties as mother and housewife.

Although this patient was treated in state and municipal sanitariums, 40 specimens studied for the tubercle bacillus had never revealed it. The elementary observation that one is generally not justified in making a diagnosis of pulmonary tuberculosis until the organism is identified still holds true. This is to be especially noted because of the tendency of some thoracic surgeons to resort to excisional operations on roentgen evidence alone.

The need for the physician to think as a medical philosopher in this era of specialization and technical advances is well exemplified by this patient who, on the basis of roentgen evidence alone, was diagnosed as a "tubercular" and was never seen as a total patient again. During the years of her illness, a period of great emotional stress, she was away from her husband and children, and not only were their financial funds catastrophically depleted but the taxpayer was contributing indirectly. The physician's responsibility is clearly defined in this excerpt from *The Twenty-Fifth Hour* by C. Virgil Gheorghiu: "Human life has no meaning unless it is conceived as a whole. We can only grasp its ultimate purpose if we bring into play the same senses that help us to understand religion and to interpret or to create art. In the search of the ultimate end of life reason plays only a secondary role. Mathematics, statistics, and logic are as ineffectual, as guides to the comprehension and organization of human life, as they are to the appreciation of Mozart or Beethoven."*

CASE 5.—E. M., a man aged 24, had chronic diffuse bilateral tuberculosis. In 1930 he began to lose weight, and the loss persisted, with loss of strength and appetite. In the early months of 1934 he had a cough with expectoration of blood. There was a total loss of 30 pounds (13.6 Kg.) of weight in four years. He was first seen here in December 1934, and appropriate studies definitely established the diagnosis of advanced tuberculosis of both lungs.

All the customary forms of therapy were unsuccessfully tried in several tax-supported sanitariums and at the patient's home until February 1949. At this point, with the disease slowly progressing and the patient unable to work, antibiotic therapy was given in accordance with my therapeutic technic. After one month's treatment the germs of tuberculosis disappeared from the lung, and the patient made an uneventful recovery. Seven years later the patient continued to be free of tuberculosis. This patient, however, has a diminished vital capacity resulting from long-uncontrolled pulmonary tuberculosis (1930-

*This quotation is taken from *The Administrator* by Glover and Howser (Homewood, Ill.: Irwin, 1952).

1949), so that his ability to work is permanently damaged.

CASE 6.—H. K., a man aged 50, had an abscess of the right lower lobe following pneumonia in April 1948. He was treated elsewhere with intramuscular penicillin, with subsequent development of bacterial strain resistance. During the next fifteen months he had three recurrent attacks of pneumonia, with numerous hemorrhages. Lobectomy or possibly pneumonectomy was advised elsewhere for probable bronchogenic cancer or bronchiectasis. When he was seen here, marked dental sepsis was first eliminated. Then the patient was given antibiotic detergent aerosol therapy (streptomycin and penicillin, supplemented by daily parenteral therapy) for four days. Improvement was noted immediately. At the time of writing, eight years later, the patient's general condition is excellent, with no hemorrhages and no evidence of neoplasm.

It should be noted that the penicillin-resistant pathogen was eliminated by this chemotherapeutic combination.

CASE 7.—G. S., a woman aged 40, was examined on Jan. 6, 1949, with a history of bronchiectasis of the right lower lobe of two years' duration, which had followed a surgical operation for the excision of fistulas. There followed pleurisy with pneumonia, with which a putrid empyema developed; the purulent material expectorated varied from ½ to 1 cupful daily. Organisms noted in culture were gram-positive staphylococci and slightly hemolytic gram-positive bacilli.

Antibiotic detergent aerosol therapy was given for four days (600,000 units of penicillin dissolved in detergent on the first day and 300,000 units of penicillin on the next three days). Frequent follow-up reports from the patient reveal that she has made an excellent recovery. There has been no cough or expectoration since the aerosol therapy was given. At the time of writing, seven years later, the patient is in excellent health.

COMMENT

The presence of symptoms and/or viable organisms in patients who have had lobectomies or segmental resections of the lungs for bronchiestasis or pulmonary tuberculosis strongly suggests the need of a reappraisal of many of the current therapeutic technics and of reconsideration of microbiologic principles when these technics are applied.

Clinical indifference to the emergence of resistant bacterial strains was again noted in an open letter published in the *Journal of the American Medical Association*, "Potential Danger of Isoniazid Through Failure to Use Multiple Chemotherapy in Treatment of Tuberculosis." In this communication it was specifically stated: "Most physicians are already aware of the dangers inherent in the development of isoniazid resistance, but if a minority is to take the position that bacterial resistance is a laboratory curiosity of no clinical significance, the value of this drug may be greatly lessened. It is a matter of historical record that the wide use of sulfadiazine in naval training centers during World War II eventually resulted in the establishment of streptococcic types resistant to sulfonamides (Epidemiology Unit No. 22, J.A.M.A. 129:921-927 [Dec. 1] 1945). This unfortunate experience... appears to have been largely forgotten."

SUMMARY

A plan for treatment of suppurative pulmonary diseases, including tuberculosis, outside the hospital and in an oriented medical group, is presented. The treatment is chemotherapeutic; the pathogenic organisms are attacked by means of drugs dissolved in a detergent solvent administered in a fine mist of droplets. A high degree of cooperation on the part of the patient is absolutely necessary for success; therefore, preliminary and continued instruction become an integral part of the treatment.

Seven cases are reported, with good results. The author places strong emphasis on the personal element and the doctor-patient relation, pointing out that the tendency to think of the patient as a "case" is apt to obscure the practitioner's view of him as a total personality.

RESUME

L'auteur presente un tableau des affections pulmonaires suppurantes (y compris la tuberculose) Le traitement est chimiotherapique, les organismes pathogeniques sont attaques au moyen de medications administrees sous forme d'aerosols La collaboration etroite du malade est indispensable au succes, il faut lui donner, au sujet du traitement, des instructions preliminaires et repetees

Six cas, avec d'excellents resultats, sont exposes L'auteur insiste encore sur l'importance primordiale de l'element personnel et des rapports de medecin a patient, car la tendance a considerer le malade comme un "cas" est de nature a empêcher le praticien de le voir en tant que personnalite propre

RIASSUNTO

Presentazione di un gruppo di malattie suppurative del polmone, compresa la tubercolosi La cura e a base di prodotti chemioterapici somministrati per aerosol Per il buon fine della terapia e assolutamente necessario un alto grado di cooperazione da parte dei pazienti, pertanto fanno parte del piano terapeutico istruzioni preliminari e continuate Vengono riportati sei casi con buoni risultati L'autore insiste sull'importanza dell'intesa fra medico e paziente e sottolinea il fatto che la tendenza a considerare il malato come un semplice "caso clinico" rischia di togliere al medico la visione dell'intera personalita del paziente

ZUSAMMENFASSUNG

Es wird ein Plan zur Behandlung eitriger Lungenerkrankungen einschliesslich der Tuberkulose ausserhalb des Krankenhauses vorgelegt Es handelt sich um ein chemotherapeutisches Verfahren, die Krankheitserreger werden durch Verabreichung von Medikamenten in einem feinen Tropfchennebel angegriffen Zum Erfolg ist eine hochgradige Mitarbeit des Kranken unerlasslich Die Vorbereitung und fortgesetzte Belehrung des Kranken bildet daher einen wesentlichen Teil der Behandlung, auf den nicht verzichtet werden kann Es wird uber 6 Falle mit gutem Behandlungserfolg berichtet

Der Verfasser betont mit Nachdruck die Bedeutung der personlichen Beziehung zwischen Arzt und Patient, und weist darauf hin, dass die Betrachtung des Kranken als 'Fall" dazu fuhren kann, dass der Arzt den Blick fur die Gesamtpersonlichkeit des Kranken verliert

SUMARIO

Um plano de molestias pulmonares supurativas, inclusive a tuberculose, fora do hospital e em um grupo medico oriental e apresentado O tratamento e quimoterapêutico, os organismos patogenicos são atacados por meio de drogas administradas em transparentes goticulas Um alto grau de cooperação por parte do doente e absolutamente necessario para o sucesso, portanto, a instrução preliminar e continuada torna-se parte integral do tratamento

Seis casos com bons resultados são relatados O autor coloca forte ênfase no elemento pessoal e na relação medico-paciente, salientando que a tendencia para se pensar no paciente como um "caso" esta apta para obscurecer a consideração dele pelo medico como uma personalidade total

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The final aim and end of medicine must be the elimination of ill-health, yet the early period of any new development always brings out new conditions which people never knew they suffered from. The fact that a surgeon was available produced more cases for him to treat. As soon as there was an eye trained to see them, fresh surgical territories came into view. This is only another way of stating that when there is no treatment, people suffer and even die in silence, but a new method brings them flocking to the hospital with fresh hope.

The pressure of their opportunity was deflecting the Mayos from general practice, forcing them to concentrate upon surgery, where almost everything they touched was new and the chances of self-development were enormous. In after years when their work had become world-famous, they would say that their success was due only to the fact that they had been born at a particular moment when the whole of modern surgery was new, and that modest statement is an imporant part of the truth. It was indeed the golden age of exploration.

—*Williams*

Bronchial Carcinoma

Review of Two Hundred Cases

RAFAEL ALASCIO ESCOBAR, M.D., F.I.C.S.

TUCUMAN, ARGENTINA

WITHIN the lapse of five years I have studied 200 cases of bronchogenic carcinoma. This experience is the basis of the data here to be presented.

Distribution According to Age and Sex.—All but a few of the patients in this series were men (Table 1). Almost all were between 40 and 60 years of age; none was under 20, and only a few were more than 80 (Table 2).

Distribution According to Lung Affected.—The left lung was more commonly affected (115 cases, or 57.5 per cent) than was the right (85 cases, or 42.5 per cent). Considering each lung separately, the distribution in the 85 cases of involvement of the right lung was as follows: The upper lobe was involved 43 times (50.58 per cent); the middle lobe 7 times (8.21 per cent), and the lower lobe 27 times (31.74 per cent). In 13 cases (15.3 per cent) several lobes were involved. On the left side, the upper lobe was involved 115 times (57.3 per cent); the lower lobe 25 times (21.73 per cent) and both lobes 11 times (10.8 per cent). These data are presented in Table 3.

Distribution According to Thoracic Location of Neoplasm (Table 4). — I have divided these bronchogenic carcinomas, according to their thoracic sites, into two groups: Group A, hilar, and Group B, peripheral. In Group A are included (1) those tumors which were confined exclusively to the lumen of the bronchus; (2) those which involved the mediastinum, and (3) those which were accompanied by pulmonary anatomic and roentgenographic change. In Group B (peripheral tumors) I classify (1) nodular growths; (2) invasive tumors, and (3) tumors of the pleuropulmonary type, in which the lung and the pleura were involved.

In 130, or 65 per cent, of my 200 cases the tumors fell into Group A (hilar carcinoma). Seventy of these were subclassified as Group A_1 (pure hilar); 36 as Group A_2 (hilar-mediastinal), and 24 as Group A_3 (pulmonary-hilar).

The tumors in the remaining 70 cases (35 per cent) fell into Group B (peripheral carcinoma). Of these, 50 were subclassified as Group B_1 (nodular); 13 as Group B_2 (invasive), and 7 as Group B_3 (pleuropulmonary). The tumors in Group A_2, some of those in Group B_2 and all of those in Group B_3 were nonresectable.

Distribution According to Operative Status.—From this point of view I have classified the tumors as follows: inoperable, 35, or 17.5 per cent; operable, 165, or 82.5 per cent. Among the patients concerned in the latter group were those who refused operation, those who could tolerate operation but whose tumors were nonresectable and those whose tumors were resected (Table 5).

I was able to establish correlation between inoperability and the anatomic forms, and from this point of view I have divided the tumors into two categories, "clinically inoperable" and "nonresectable" (Table 6). Six patients with tumors in the former group were cachectic; 5 had

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clinically demonstrable metastases, 2 to the skin, 2 to the lymph nodes and 1 to the brain; 7 had the pleuropulmonary type of tumor (Group B_3); in 15 the tumors were hilar-mediastinal growths, and in 2 the neoplasms were invasive (Group B_2).

TABLE 1.—*Sex Incidence*

Sex	*No. of Patients*	*Percentage*
Male	175	87.5
Female	25	12.5

TABLE 2.—*Sex and Age Distribution*

Age	*No. of Patients*	*Percentage*	*Male Patients*	*Percentage*	*Female Patients*	*Percentage*
—20	....	.....	....	.....	....	.....
20-30	5	2.5	4	80	1	20
30-40	18	9	14	77.7	4	22.2
40-50	10	5	8	80	2	20
50-60	67	33.5	58	86.51	9	13.41
60-70	84	42	73	89.29	11	13.09
70-80	10	5	10	100	....	.....
+80	6	3	6	100	....	.....
Total	200	100	175	87.5	25	12.5

TABLE 3.—*Lung Involved*

	No. of Cases	*Percentage*	*No. of Cases*	*Percentage*
Right				
Upper lobe	85	42.5	43	50.58
Middle lobe			7	8.21
Lower lobe			27	31.74
Several lobes			13	15.3
Left				
Upper lobe	115	57.3	79	68.7
Lower lobe			25	21.73
Both lobes			11	10.8

TABLE 4.—*Site of Neoplasm*

	No. of Cases	*Percentage*	*Group*	*No. of Cases*	*Percentage*
Hilar	130	65	A_1	70	53.84
			A_2	36	27.69
			A_3	24	18.46
Peripheral	70	35	B_1	50	71.43
			B_2	13	18.57
			B_3	7	1

TABLE 5.—*Distribution According to Operability in 200 Cases*

Operative Status	*No. of Cases*	*Percentage*	*No. of Cases*	*Percentage*	*No. of Cases*	*Percentage*
Inoperable	35	17.5				
Operable	165	82.5				
Operation refused			15	7.5		
Operation performed			150	75		
Nonresectable					38	19
Resectable					112	56

In the second group there were 9 with metastases, 4 to the heart and pericardium and 5 to the regional lymph nodes; 21 with hilar-mediastinal carcinomas that could not be clinically established as inoperable; 5 with invasive tumors, all of which were associated with the Pancoast syndrome, and 3 with tumors of the type classified as hilar-pulmonary.

Considering the number of cases I have had opportunity to study and the number of cases in which the tumor was resected, it is obvious that surgeons have not yet arrived at the ideal situation with regard to the treatment of bronchogenic carcinoma. In this series the cases in which the tumors were inoperable were those in which the patients had clear and obvious symptoms on first consulting me. It is safe to say that when the diagnosis is clinically

TABLE 6.—*Inoperable and Nonresectable Tumors*

Criteria	*Inoperable*	*Nonresectable*	
Cachexia	6		
Metastasis	5	9	
Pleuropulmonary carcinoma	7		
Hilar mediastinal carcinoma	15	21	
Invasive carcinoma	2	5	(Pancoast syndrome)
Pulmonary hilar carcinoma		3	

easy the surgeon is generally unable to act with any effectiveness

As always, the most promising cases in this series were those in which the neoplasm was discovered by means of a systematic study of the general hospital population

Between these two limits were cases in which the indications for surgical intervention were by no means clear, so that only by performing an exploratory thoracotomy could I determine whether or not the tumor was resectable

Carcinomas that may be considered clinically inoperable are (1) the metastatic forms, (2) neoplasms producing clear and definite symptoms, and (3) in some cases forms associated with the Pancoast syndrome

It is my conviction that the statistical results of therapy will be improved only when a permanent and systematic campaign of examination and general education is instituted to fight bronchogenic carcinoma

Distribution According to End Results—Of the 200 cases, no operation was performed in 50 (25 per cent) Thoracotomy was done in 150, in 58 of which (19 per cent) the neoplasms proved to be nonresectable In 112 (56 per cent) resection was done Deaths and survivals are listed in Table 7

Mortality—As has been stated, I performed thoracotomy for primary bronchogenic carcinoma in 150 cases, in only 112 of which was I able to resect the tumor Of the 150 thoracotomized patients, 78 (45 per cent) are dead at the time of writing, of these, 12 (15 4 per cent) died in the hospital and 66 (84 8 per cent) after their discharge Of the 112 patients whose tumors were resected, 40 (37 5 per cent) are dead, 9 (22 5 per cent) died in the hospital and the remaining 31 (77 5 per cent) after leaving it

Of the 38 patients with nonresectable tumors, all (100 per cent) are dead Three

TABLE 7.—*End Results*

Operative Status	*No. of Cases*	*No. of Operations*	*Death*						
			24 hr	*1-6 mo*	*7-8 mo*	*9-12 mo*	*2 yr*	*3 yr*	*4 yr*	*Living*
Inoperable	35		6	9	14	6				
Operable	165									
Operation refused	15		4	8	3					
Operation performed	150									
Resection performed	112	4	5			2	9	8	12	72
Nonresectable	38	1	2	8	9	10	8			
Total	200	5	7	18	26	29	23	8	12	72

TABLE 8.—*Mortality Statistics*

Treatment	*No. of Cases*	*Death*					
		No. In Hospital	*% In Hospital*	*No. After Discharge*	*% After Discharge*	*Total No.*	*Total %*
Thoracotomy	150	12	15 4	66	84	76	45 3
Resection	112	9	22 5	31	77	40	35 7
Nonresectable	38	3	7 6	35	92	38	100

died in the hospital and the remaining 35 (92.5 per cent) after they were discharged (Table 8).

CONCLUSIONS

The author presents a statistical survey of 200 cases of bronchial carcinoma, studied personally over a period of five years. He classifies the tumors into two categories: Group A, hilar, and Group B, peripheral. Group A is subdivided into three types: A_1, tumors confined to the lumen of the bronchus; A_2, those involving the mediastinum, and A_3, pleuropulmonary tumora. Group B is also subdivided three times: B_1, nodular tumor; B_2, invasive tumors, and B_3, pleuropulmonary tumors. The numbers and percentages of each type of tumor encountered are presented in tabular form, as are data on the incidence of each type from the points of view of age, sex, lung affected, thoracic location and operative status.

Notwithstanding the progress made in any field of therapy for bronchogenic carcinoma, especially the surgical field, the ideal results have not yet been attained, though from day to day surgeons seem to be approaching it.

It is imperative that the lesion be discovered in its early stages and that immediate action be taken. The patient should be studied thoroughly but quickly, and operation should be performed at the earliest feasible moment.

In the author's opinion his statistics indicate progress, since he is constantly engaged in systematic examination of the hospital population, especially those patients who have passed the age of 40.

CONCLUSIONS

Malgré les progrès accomplis dans tous les domaines de la thérapeutique du carcinome bronchogénique spécialement en chirurgie, des résultats parfaits n'ont pas encore été obtenus mais nous nous en approchons de plus en plus.

Il est indispensable d'étudier le malade à fond mais rapidement, il faut établir autant que possible un diagnostic précoce et Opérer sans retard.

L'auteur attribue ses bonnes statistiques personnelles au fait qu'il pratique chez tous ses patients, surtout chez ceux ayant dépassé la quarantaine, des examens fréquents et systématiques.

CONCLUSIONI

A dispetto dei progressi compiuti in ogni campo della terapia del carcinoma bronchiale, specialmente nel campo chirurgico, i risultati non possono ancora considerarsi soddisfacenti.

E' assolutamente necessario scoprire la lesione nei primi stadi, studiare il malato con completezza e rapidità e operarlo il più presto possibile. Secondo l'autore, le sue statistiche sono buone perchè egli usa sottoporre ad esami continui e sistematici i pazienti, specie se abbiano superato i quarant'anni d'età.

SCHLUSSFOLGERUNGEN

Trotz der Fortschritte auf allen Gebieten der Behandlung des bronchogenen Karzinoms besonders in der Chirurgie sind noch keine idealen Erfolge erreicht worden, wenn auch die ärztliche Kunst dem Ziele täglich näher zu kommen scheint.

Es ist unerlässlich, die Erkrankung in ihrem frühen Stadium zu entdecken, durch rasche, aber sorgfältige Untersuchung des Kranken unverzüglich die Initiative zu ergreifen und so früh wie möglich zu operieren.

Der Verfasser glaubt, dass seine günstigen Statistiken darauf beruhen, dass er sich einer ständigen und systematischen

Untersuchung von Kranken, besonders solcher im Alter von uber 40 Jahren, widmet

CONCLUSOES

Não obstante o progresso feito em qualquer campo de terapia para o carcinoma bronquiogênico, especialmente no campo cirurgico, os resultados ideais ainda não foram obtidos, embora dia a dia a profissão se aproxime dêles

Torna-se imperativo descobrir a lesão nos primeiros estagios e agir imediatamente, estudando-se o paciente minuciosamente mas com rapidez, e operar o mais breve possivel

A estatistica do autor e bôa, em sua opinião, porque êle faz exame continuo e sistematico dos pacientes, especialmente daqueles de mais de 40 anos

In 1894 Brown Sequard made his final, though this time involuntary experiment, and with his own hand wrote out the notes of his observations, according to his precise and invariable custom It was to be his last series of observations A case of arterial disease of the brain

He suffered a 'stroke' due to the bleeding of an artery, and in a letter to one of his old colleagues in London, he described, with minute exactitude, his own symptoms, the loss of vision, the temporary failure of memory As yet there was no paralysis, but this, he added grimly to his friend, was to be expected later Now, at last, he had come to the end of his magnificent capital, his energy of mind and body

He lost his third wife and suffered once more from that insupportable loneliness which can be cured perhaps when a man is young and healthy, but to the aged is a sentence of death Even his much publicized testicular extract failed to restore his strength 'I can no longer work, all is finished,' he wrote

—*Williams*

Shock y Stress: Uso de la Hidrocortisona Intravenosa (Cortef) en el Tratamiento del Shock Quirurgico.

ALFONSO BONILLA-NAAR, M.D., F.A.C.S., F.I.C.S.*

BOGOTA, COLOMBIA

DURANTE las intervenciones quirúrgicas agregamos a las alteraciones ya existentes una serie de modificaciones propias de la anestesia y la intervención, cuyo grado depende de la intensidad del trauma quirúrgico. Las reacciones orgánicas ante la cirurgía son explicables por el síndromo general de adaptación (SGA) y su conocimiento es imperativo para el cirujano, ya que proporciona las bases generales del tratamiento del "shock," que indudablemente es una de las complicaciones más severas del acto quirúrgico.

Las ideas originales de Claudio Bernard, que establecieron la estabilidad del medio interno como el objetivo de los fenómenos vitales, continuadas por Cannon[1] con la introducción del concepto de homeostasis en Fisiología, han sido coronadas brillantemente por los estudios de Selye[2, 3, 4] que culminan con la teoría del "Stress" y del síndrom general de adaptación.

Cuando el organismo se ve sujeto a factores que tienden a desviarle de su estado de homeostasis, ya sean traumatismos, reacciones emotivas, tensión psicomotora, etc., sufre una serie de modificaciones encaminadas a adaptarse a esta nueva situación (Síndromo General de Adaptación ó SGA), las cuales a veces pueden producir en sí manifestaciones aún más severas que las originales, creando un verdadero estado patológico que es conocido como "Stress."

Las tres etapas características del SGA son: a) la *reacción de alarma,* o ses la suma de todos los fenómenos específicos provocados por una exposición brusca a estímulos que afectan grandes extensiones del organismo (alarmógenos, Pascualini)[5] y que pueden provocar el estado de "shock"; b) el *estado de resistencia,* durante el cual las reacciones generales de adaptación actúan tratando de contrarrestar los estímulos extraños y c) el *estado de agotamiento,* que representa, como su nombre lo indica, el agotamiento de la capacidad orgánica para resistir.

Los alarmógenos más importantes son aquellos que obran sobre una porción extensa del organismo y pueden ser de variada naturaleza. Los más comunes, los grandes traumatismos, entre los cuales las quemaduras son las más importantes; el frío, las hemorragias, etc. Con las intervenciones quirúrgicas se pueden presentar además alarmógenos netamente quirúrgicos, como la atonía intestinal de la peritonitis; la recuperación funcional del intes-

*Profesor Agregado de Clinica Quirurgica de la Facultad Nacional de Medicina Universidad Nacional, Bogotá Miembro Vitalicio de la A N G E.

El "Cortef" Intravenoso utilizado en este estudio fue proporcionado por el Departamento Medico de la Division Internacional de The Upjohn Company, Kalamazoo, Michigan, U. S. A.

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tino despues de la atonia, el reposo *prolongado en cama, y muchos otros* que pueden implicar disminución del volumen sanguineo y trastornos vasomotores los que con frecuencia se suman a los mencionados p r e v i a m e n t e en el paciente quirurgico, siendo esta la razon por la cual el "shock" constituye una complicacion frecuente en cirugia

El estado de "shock" corresponde a una lesion generalizada intensa, de desarrollo agudo, caracterizada por depresion del sistema nervioso, hipotension, hipotermia, hemoconcentracion, taquicardia, hipotonia muscular, trastornos de la permeabilidad capilar y celular, desintegracion tisular generalizada (impulso catabolico), hipo cloremia, hipokalemia, hiperglucemia efimera, seguida de hipoglucemia, leucopenia y erosiones gastrointestinales agudas (ulceras de Curling) , a veces toma un curso "irreversible" pudiendo producir la muerte El Shock para Selye (L c) es una "necrobiosis" generalizada aguda

No corresponde a este trabajo realizar una exposicion de los diveros factores relacionados con la aparicion de un estado de "shock," ni el discutir todas las medidas terapeuticas aconsejables en estas circunstancias, sino mas bien referirnos a uno de los fenomenos fisiopatológicos mas importantes que se relacionan con este cuadro y que en *gran parte explican sus* manifestaciones el papel de la corteza suprarrenal en la patogenia del "shock"

De acuerdo con las ideas de Selye, la presencia de la hipofisis anterior es imprescindible en la configuracion del SGA, lo cual esta basado en numerosos hechos experimentales Cuando el "Stress" alcanza el lobulo anterior de la hipofisis, determina el llamado *desvio hormonal del 'Stress,"* que consiste en el aumento de la descarga de corticotropina (ACTH), el de la somatotropina (ST) y muy probablemente el de la tirotropina (TT), con disminucion de las tres gonadotropinas La produccion de ACTH, sin embargo, puede *modificarse por diversos factores, como la* deficiencia proteinica, la de colina, la edad avanzada y otros

El *desvio hormonal del "Stress"* repercute en la suprarrenal, la cual bajo la accion del ACTH y la somatotropina produce una mayor cantidad de sus corticoesteroides que se encargan, en grado importante, de crear resistencia frente a la agresión del organismo

Son numerosas la hormonas elaboradas por la corteza suprarrenal, y han sido divididas en tres grupos 1 —*Glucocorticoides* o corticoides antiflogisticos, cuyo efecto metabolico se ejerce fundamentalmente sobre el metabolismo organico, aunque ejerce tambien un efecto moderada sobre el metabolismo del agua y electrolitos, de los cuales la Cortisona (Compuesto E) y la hidrocortisona (Compuesto F) son los ejemplos mas representativos 2 —*Mineralocorticoides,* o corticoides proflogisticos, cuyo efecto sobre el metabolismo mineral es mucho mas intenso que sobre el organico, como la desoxicorticosterona (DOCA) y la Aldosterona 3 —*Corticoides s e x u a l e s, fundamentalmente androgenicos* La presencia de estos esteroides corticoadrenales, junto con la somatotropina, aseguran la defensa y resistencia del organismo

Estudios en animales de experimentacion, como los realizados por Goldstein y colaboradores,[6] Fritz y Levine[7] y otros, han confirmado el papel de la corteza suprarrenal en el "Shock" y señalan su presencia como necesaria para que se obtenga una respuesta adecuada a los vasoconstrictores, ya que animales adrenalectomizados no responden con la misma intensidad que animales intactos, cuando reciben infusiones de noradrenalina

De acuerdo a lo anterior, se puede apreciar la importancia de tener presente la fisiologia de la corteza suprarrenal durante las intervenciones quirurgicas, no solo pensando en la posibilidad de encon-

trarnos ante un paciente con función suprarrenal deficiente, sino considerando también que aún las suprarrenales normales dependen para su función última de una distribución adecuada de sus productos hormonales en todos los tejidos, la cual no puede obtenerse si hay alguna interferencia con la circulación normal.

Inicialmente se consideró aconsejable el administrar esteroides corticoadrenales a los pacientes quirúrgicos que previamente habían estado sujetos a terapia sistemática con cortisona o hidrocortisona, con el objeto de compensar la función deficiente de las suprarrenales atrofiadas por la administración exógena de esas hormonas (insuficiencia suprarrenal iatrogénica), para protegerlos del "Stress" propio de la intervención[8, 9, 10] o para contrarrestar la insuficiencia suprarrenal postoperatoria, observada por algunos cirujanos.[11] Esta medida pareció imperativa, en vista de que informaron algunos casos de pacientes que encontrándose en terapia de esteroides fueron operados, sin reforzar la dosis, desarrollando "shock" irreversible y muerte;[12, 13] Simmons[14] refiriéndose a esta eventualidad, afirma que los individuos que se encuentran sujetos a terapia sistemática con cortisona o hidrocortisona, pueden tolerar la cirugía si se aumenta la dosis diaria 2 ó 3 días antes de la intervención, y se administra hidrocortisona intravenosa durante el acto quirúrgico mismo. En la actualidad existe un criterio más general sobre el uso de la hidrocortisona intravenosa durante el acto quirúrgico, pués se ha demostrado que hasta la intervención quirúrgica más insignificante aumenta en grado importante la secreción de hormonas corticosuprarrenales,[15] lo cual indica, claramente, que el organismo se encuentra sujeto a un cierto grado de "Stress." En diversas manifestaciones de "shock," la administración intravenosa de hidrocortisona se ha encontrado sumamente eficaz, como en los casos de Lundy,[16] Abbott y colaboradores[17] y Rukes y colaboradores.[18] Los esteroides cortisosuprarrenales aumentan la capacidad defensiva del organismo ante el "Stress" inespecífico[19] y algunos consideran que su uso en cirugía debe ser tan rutinario como los antibióticos, en pacientes con peritonitis y otros cuadros quirúrgicos caracterizados por una intensa respuesta inflamatoria y extrema toxidad sistémica;[21] Howland y colaboradores[22] consideran que la hidrocortisona intravenosa es el tratamiento lógico cuando aparecen signos de hipofunción corticoadrenal durante las intervenciones quirúrgicas. Estos investigadores informan siete casos que presentaron alguna forma de insuficiencia de la corteza suprarrenal durante el acto quirúrgico o el período postoperatorio inmediato, y que respondieron favorablemente a esta terapia. Los signos de insuficiencia corticoadrenal ordinariamente encontrados fueron: una hipotensióón persistente, que no responde a la trasfusión de sangre, ni a la administración de vasoconstrictores, la cual se acompaña de depresión respiratoria y prolongación de los efectos de la anestesia. Vistas estas relaciones tan estrechas y particularmente en cirurgía de la Tuberculosis Pulmonar (Mejía-Díaz Granados)[23] se impone la prueba de Thorn sistemática en todo caso de cirugía mayor.

La hidrocortisona es el esteroide predominantemente producido por la corteza suprarrenal y se calcula que se produce en cantidades de 20 mg. al día en el individuo normal (Altrock y Bondy).[21] Sin embargo, en períodos de "Stress" agudo, el requerimiento de hidrocortisona puede ser diez o más veces mayor y si el mecanismo hipofisis-suprarrenal es incapaz de adaptarse, se produce una caída de la presión arterial, taquiesfigmia, hemoconcentración, coma y frecuentemente la muerte. La racionalidad de administrar hidrocortisona exógena para compensar esta insuficiencia es, por lo tanto, obvia.

Nosotros hemos tratado con hidrocortisona intravenosa (Cortef) veinte casos de "shock" quirurgico, utilizando este esteroide como unica medida terapéutica contra el mismo, o en pacientes en que otras medidas convencionales habian dado un resultado pobre o nulo, considerandose el "shock irreversible" en muchos casos Igualmente como preventivo del "Shock" en pacientes tratados largos períodos con cortisona y Meticorten (Prednisone) hasta por cinco años uno de ellos (Observación No 21), o en aquellos sometidos a graves exeresis (No 22)

Nuestra casuística es la siguiente (Junio a Diciembre de 1955):

CASO 1—T C, 21 años, mujer Faringogastrostomía extrapleural (Robertson-Serjeant) por estenosis esofagica cicatricial Empieza la operacion con TA 90/60, pulso 84 A las dos horas se presenta estado de "shock" perdiendose la percepcion de la TA y haciendose incontable el pulso A los 15 minutos de administrar 100 Mg de "Cortef" intravenoso, en 500 c c de dextrosa al 5%m la TA sube a 40/20, abandonando la sala 45 minutos despues con TA de 80/60 y pule de 90 En el curso postoperatorio se administraron 100 Mg de "Cortef" intravenoso y Cortisona intramuscular, durante las primeras 72 horas, la TA oscila entre 80 y 120 de maxima y 50 70 de minima Un segundo estado de "shock" aparece subitamente al cuarto dia postoperatorio, con una TA de 30/0 y 160 de pulso Este cuadro cede a la administracion de 100 Mg de "Cortef" intravenoso y 20 Unidades de ACTH La evolucion es satisfactoria, cicatrizacion normal (Caso del autor, Hospital San Juan de Dios)

CASO 2—E M, 25 años, mujer Artrodesis de la columna dorso lumbar por osteitis tuberculosa Inicia operacion con TA de 100/60 y 84 de pulso A las tres horas se presenta "shock," haciendose inaudible la Ta y perdiendose el pulso Se administran 100 Mg de 'Cortef" intravenoso y a las dos horas se ha recuperado la TA que ahora es de 100/60 y el pulso es de 110 Evolucion favorable (Caso del Dr Efrain Rueda Arguello, Hospital de San Juan de Dios)

CASO 3—H M R, 26 años, mujer Histerolinfoadenectomia Al ingresar a la sala

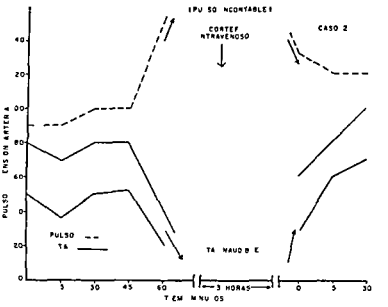

Fig 1—Efectos de la hidrocortisona intravenosa en el caso No 2

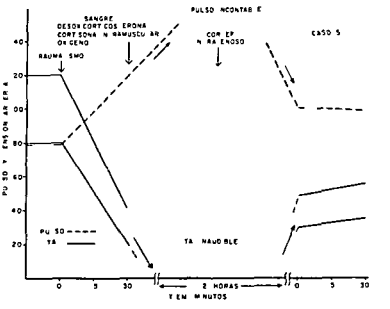

Fig 2—Efectos de la hidrocortisona intravenosa en el caso No 5

de cirugia la TA es de 100/60 y el pulso es de 70 En el transcurso de la operacion desarrolla "shock" (TA CERO) que se controla con 100 Mg de "Cortef" intravenoso, 1000 c c de sangre y 500 c c de dextrosa al 5% Al concluirse la intervencion la TA es de 80/50 Evolucion favorable (Caso del Dr Guillermo Lopez Escobar, Hospital de San Juan de Dios)

CASO 4—H G, 39 años, hombre, Gastrectomia total via abdominal por carcinoma gástrico En la sala desarrolla hipotension (maxima 4) que se controla con 100 Mg de "Cortef" intravenoso y transfusion de sangre total Evolucion favorable (Caso del Dr Alvaro Caro Mendoza, Hospital de San Juan de Dios)

CASO 5.—T. G., 32 años, mujer. "Shock" traumático de media hora de duración. TA 40/20 pulso 120., con probable fractura de fémur y pelvis.

A pesar de la administración de 1.500 c.c. de sangre, cortisona intramuscular, desoxicorticosterona y oxígeno, la TA disminuye aún más haciéndose inaudible y el pulso aumenta a 140, ha ciéndose filiforme, persistiendo este cuadro después de una segunda transfusión de 500 c.c. de sangre.

En vista de la severidad del caso se administran 100 Mg. de "Cortef" intravenoso a través de cateterización yugular, y media hora después, la TA ha subido a 50/30 pasando a cirugía con diagnóstico de ruptura vesical: laparatomía y sutura de la vejiga. Hora y media después sale de la sala de operaciones con TA de 80/60 y pulso de 120. El postoperatorio evoluciona favorablemente. (Caso del Dr. Luis Quintero, Hospital de San Juán de Dios.)

CASO 6.—M. T. E., 26 años, mujer. Intervenida por otro colega hacía ocho días por oclusión intestinal, consecuencia inmediata de la extirpación de un fibroma uterino. En estado franco de peritonitis le realizamos una resección intestinal, por oclusión intestinal. Presenta bajas tensionales en la operación (4-5 Máx.), las cuales ceden a la administración de 100 Mg. de "Cortef" intravenoso en 500 c.c. de dextrosa al 5% y 500 c.c. de. sangre. En el postoperatorio se aplicaron otros 100 Mg. de "Cortef," Es intervenida nuevamente (cuarta vez) por cuatro fístulas del yeyuno, en pésimas condiciones generales (Evolución de 20 días). Al terminar la intervención (nueva resección intestinal) presenta, a pesar de 100 Mg. de "Cortef" previos, TA imperceptible y pulso incontable. La aplicación de 100 Mg. de "Cortef" intravenoso produce la ascensión lenta de la TA la cual alcanza 80 de máxima por 60 de mínima y se sostiene con cortisona intramuscular y ACHT al final. Evolución satisfactoria. Se le aplicaron en un mes 400 Mg. de Hidrocortisona y fue dada de alta con aceptable cicatrización de las heridas. (Caso del autor, Clínicas Marly y Camero.)

CASO 7.—M. A., 83 años, mujer. Toracotomía y sutura esofágica por perforación instrumental del esófago. Al abondonar la sala de operaciones una TA de 120/80, baja a 40/20, a las seis horas. A las 28 horas, al suspenderse el Levophed hay caída immediate con máxima de 20 y pulso de 120. La aplicación de 100 Mg. de "Cortef" intravenoso elevaron la TA a 140/80 consiguiéndose una evolución satisfactoria. (Caso del Dr. Carlos E. Camacho, Hospital San José.)

CASO 8.—J. V. L., 32 años, hombre. Laparatomia para exploración de vías biliares con hepaticoyeyunostomía por fístula biliar. Ingresa a la sala de operación con una TA de 90/60 y 80 de pulso. Durante la operación se presenta "shock" que es controlado con 100 Mg. de "Cortef" intravenoso y transfusión. Catorce días después se practica nueva intervención en cuyo curso se administran 100 Mg. de "Cortef" intravenoso. La TA al comienzo es de 110/60 y el pulso 120; al terminar, 3 horas y media después, la TA es 70/30 y el pulso 120. Diéz días después de la segunda intervención el paciente fallece. (Caso del Dr. J. A., Hospital de San Juán de Dios.)

CASO 9.—C. G., 42 años, mujer. Coledocotomía por litiasis residual del colédoco. Al iniciarse la intervención la TO es de 120/70 y el pulso de 80. Media hora después la máxima es de 70 y se administra efedrine intramuscular lográndose un ascenso transitorio de la máxima con caída posterior a 60. La transfusión de 1.000 c.c. de sangre no eleva la tensión, por lo cual se recurre a Levophed que sostiene la tensión alta durante su administración, pero cae al suspenderse. Al concluírse la intervención la máxima es de 60 y se aplican 100 Mg. de "Cortef" intravenoso que la eleva a 110 en forma permanente. La evolución es satisfactoria. (Caso del Dr. Hernando Anzola Cubides, Hospital San Juán de Dios.)

CASO 10.—A. G., 32 años, hombre. En el curso postoperatorio de una colecistectomía, se presenta "shock" con depresión orgánica general.

El pulso es filiforme e hipotensión constante con cifras variables.

(7, 6 Máx.) El paciente reacciona notoria y rápidamente a la administración de 100 Mg. de "Cortef" intravenoso, a intervalos de 12 horas, (200 Mgs.) La evolución fué satisfactoria. (Caso del Autor, Clínica Marly.)

CASO 11.—A. B., 24 años, mujer. En el curso postoperatorio de una Neumonectomía por T.B.C., se presenta considerable hipotensión con TA de O. La TA normal se recuperó con la administración de 100 Mg. de "Cortef" intravenoso en 500 c.c. de dextrosa al 5% y 1 c.c. de Levophed.

La evolución tensional fué satisfactoria. Hubo diseminación o reactivación de la Tuberculosis en el otro pulmón y pericarditis, de lo cual se recuperó. (Caso del Autor, Hospital Santa Clara.)

CASO 12.—G. A., 20 años, mujer. En una segunda intervención practicada 90 después

de una neumonectomia por T B C, por formación de una fistula bronquial, se presento considerable hipotension cifras de 60/40 La administracion de 100 Mg de "Cortef" intravenoso en 500 c c de solucion de glucosa al 5% en venoclisis, y de sangre, produjeron ligera recuperacion de la TA, pero la paciente abandono la sala de operaciones con cifras tensionales muy bajas Una segunda administracion de 100 Mg de "Cortef" intravenoso en 500 c c de dextrosa al 5% con una ampolleta de Wifentermina, volvieron a valores fisiologicos la TA La evolucion fué satisfactoria (Caso del Dr Jose Pablo Leyva, Hospital Santa Clara)

CASO 13—C R, 50 años, hombre Coledocotomia para extirpacion de calculos intracoledocianos Durante las diez primeras horas del curso postoperatorio la TA es normal, pero luego baja hasta alcanzar 85/60

La administracion de 100 Mg de "Cortef" intravenoso en 500 c c de dextrosa al 5% estabiliza la TA en 100/70 (Caso del Autor, Clinica de Marly)

CASO 14—A E U, 26 años, mujer Reseccion intestinal por secuela colica en el tratamiento quirurgico de fistula rectovaginal Tres horas despues de abandonar la sala de operaciones con TA de 80/60 se presenta un cuadro de "shock" sin pulso ni TA, el cual se trata como medida de urgencia con 20 Unidades de ACTH en 500 c c de dextrosa al 5%. Tres horas despues el cuadro de "Shock" continúa y se aplica Levophed, produciendose un ascenso de la TA, el cual es transitorio, pués la TA desciende de nuevo a 40/10 Se administran entonces 100 Mg de "Cortef" intravenoso, en 500 c c de dextrosa al 5% y el cuadro mejora lentamente llegando la TA estabilizada en 90/60, cediendo finalmente el cuadro de "shock" (Caso del Dr Alfonso Linares, Hospital de San Juan de Dios)

CASO 15—L B, 56 años, hombre Colectomia subtotal y anastomosis termino lateral ileo colonica por adenocarcinoma del colon Seis horas despues de salir de la sala de operaciones en estado satisfactorio, se produce una caida de la TA a 60/40, con pulso de 120, sudor y palidéz

Se administran 100 Mg de "Cortef" intravenoso en 500 c c de dextrosa al 5% y lentamente la TA sube hasta 90/60, sosteniéndose hasta el otro dia que sube a 100/60 El curso postoperatorio fue favorable (Caso del Dr Alfonso Linares, Hospital de San Juán de Dios)

CASO 16—T P, 28 años, hombre Reseccion intestinal para correccion de fistula estercolacea de origen tuberculoso Al terminar la intervencion hay una TA de 100/80 y pulso de 70 Poco despues se aprecia descenso paulatino de la TA que llega a 50/20, 10 horas despues, aproximadamente, con signos de colapso periferico y pulso de 120 Poco despues hay un franco cuadro de "shock," que persiste inalterado al dia siguiente a pesar de la administracion intramuscular de ACTH cada dos horas, en vista de la dificil administracion intravenosa por colapso en las venas Se logra, finalmente, administrar "Cortef" intravenoso en infusion que se pasa "en chorro," obteniendose respuesta favorable a los 5 minutos, con ascenso de la TA que alcanza 120/80, se reduce la velocidad de la venoclisis a 20 gotas por minuto y se estabiliza la TA a 110/70, el pulso es de 80 Se produce una evolucion lenta, con cifras tensionales variables, pero sin hipotension y finalmente se obtiene la estabilizacion (Caso del Dr Alfonso Linares, Hospital de San Juan de Dios)

CASO 17—F A, 28 años, hombre Craneotomia parieto occipital por tuberculoma cerebral, con extirpacion del mismo Después de una intervencion de 3 horas de duracion, que se desarrollo dentro de la mayor normalidad, al proceder se a suturar la piel, el enfermo entra en estado de "shock," con frecuencia cardiaca incontable administrandose 1 000 c c de sangre y 500 c c de suero dextrosado, con Levophed y Pronestil, sin ningun resultado aparente Tres horas despues se administran

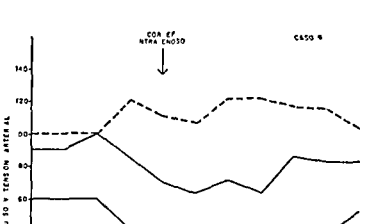

Fig 3—Efectos rtisona intrav
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100 Mg. de "Cortef" intravenoso, en 500 c.c. de suero dextrosado, gota a gota, con lo cual el paciente sale del "shock" en 15 minutos. Tres horas después el paciente se encuentra en estado de semiconciencia, con TA de 120/80 y 120 de pulso. (Caso del Dr. Fernando Rosas, Hospital de San Juán de Dios.)

CASO 18.—C. F. L., 50 años, hombre. Hemilaminectomía con extirpación del núcleo pulposo. Después de una intervención bien tolerada, al comienzo del curso postoperatorio, se presenta hipotensión de 60/40 sin taquicardia. La aplicación de 500 c.c. de sangre, así como de Wifentermina y Neosinefrina no modificaron la TA. Se aplica entonces "Cortef" intravenoso 100 Mg. en venoclisis con 500 c.c. de dextrosa al 5%, y se observa un ascenso de la TA desde el momento que se inicia la venoclisis, llegándose a 110/80 a los 15 minutos. Se aplicó cortisona intramuscular durante los dos días siguientes y se observó una evolución favorable. (Caso del Dr. Alejandro Jiménez Arango, Clínica de Marly.)

CASO 19.—T. R., 34 años, mujer. Bilobectomía por absceso pútrido pulmonar, no tuberculoso. En el curso de la intervención se presentó una hipotensión de 80/60, haciéndose transfusiones y administrándose 100 Mg. de "Cortef" intravenoso. Después de la operación aparece de nuevo hipotensión de 60/40, que se corrige transitoriamente con Levophed. Una segunda administración de "Cortef" intravenoso controló la TA en cifras normales.

Se inició la aplicación de cortisona intramuscular y se obtuvo evolución satisfactoria. (Caso del Autor, Hospital Santa Clara.)

CASO 20.—S. A., 28 años, hombre. "Shock" traumático por traumatismo y amputación de pierna. Ingresa a la sala de cirurgía con TA de 80/50 y pulso de 130. A los veinte minutos se presenta estado de "shock," por lo cual se administra Neosinefrina en solución de dextrosa y 2 c.c. de Levophed, elevándose la TA a 50/30, tensión que se conserva todavía 14 horas después, cuando se administran 100 Mg. de "Cortef" intravenoso en 500 c.c. de solución de dextrosa, subiendo la TA a 140/80; una hora después la TA desciende a 100/60 estabilizándose en esas cifras. Al cuarto día el paciente fallece por infarto pulmonar comprobado en la autopsia. (Caso del Dr. Rafael Pardo C., Hospital San José.)

CASO 21.—E. de C., 56 años, mujer. Ulcera gástrica perforada al páncreas en el quinto año de tratamiento de un reumatismo crónico deformante, con Cortisona y Meticorten (Prednisona). Ante el temor de un "shock" irreversible[12-13] se le aplicaron 300 Mg. de cortisona intramuscular, los tres días anteriores a la intervención, y el día mismo, ante de la laparotomía, 100 Mg. de "Cortef." Fué esto suficiente para obtener en una laboriosa gastrectomia, amplía, niveles tensionales normales (11-12 de máxima).

A las 24 horas, por descenso de la máxima, a 9, se aplicaron 100 Mg. más de "Cortef." Postoperatorio y cicatrización normales. (Caso del Autor, Clínica Marly.)

CASO 22.—Niño D. P. L., de 55 días de nacido. Para prevenir "shock" quirúrgico (atresia total de canales biliares, intra y extrahepáticos, para lo cual se hizo un largo "tunel" dentro del lóbulo derecho del hígado y se enchufó un asa yeyunal, restableciendo el tránsito con un Roux latero-lateral) se aplicaron en la operación, de 3½ horas, 40 Mg. de "Cortef" con buenos resultados. A los 45 días de operado había, aún, tránsito biliar normal al intestino, hipertrofia hepática, y la Bilirrubinemia, de 17 mgs. inicial, bajó a 5 mgrs. Estado general del niño, bueno.

RESULTADOS: RESUMEN

De los 20 casos tratados de "Shock" algunos irreversibles, con "Cortef" intravenoso incluídos en este estudio, se obtuvo la recuperación total en todos (100%) tanto cuando se utilizó "Cortef" como única o principal medida antishock (11 casos) como cuando se aplicó después de que otras medidas ordinariamente utilizadas, fallaron (5 casos) o sólo proporcionaron un efecto temporal (4 pacientes).

Es interesante anotar que en los pacientes a los cuales se administraron vasoconstrictores, tales como Levoarterenol o Efedrina, la respuesta obtenida fué adecuada, pero transitoria, a lo cual parece confirmar el criterio de que los esteroides corticoadrenales preservan o potencializan la sensibilidad del lecho vascular terminal a los agentes vasoconstrictores.[7-18]

La respuesta obtenida en algunos pacientes puede calificarse de dramática, como en los casos 2 y 5 (Figs. 1 and 2) en los cuales las cifras tensionales habían caído al grado de hacerse inaudibles, mien-

tras que el pulso habia aumentado au frecuencia ye se hacia incontable En estos casos la recuperacion se obtuvo en un lapso relativamente corto, ya que no excedio de 2 a 3 horas y en el se gundo de ellos, la administracion de sangre, DOCA, cortisons intramuscular y oxigeno, habia sido meficaz En otros pacientes, como el No 8 (Fig 3), la respuesta no fue tan impresionante, pues eran de menor intensidad, mas fue siempre segura y rapida, recuperaadose las cifras tensionales hasta en un tiempo de 15 minutos despues de la aplicacion endovenosa de 100 Mg de "Cortef" Aunque hubo dos defunciones en este grupo de 22 pacientes (casos 8 y 20) estas se produjeron muchos dias despues de que el estado de "shock" desapareciera, y fueron debidas a causas completamente ajenas al mismo

Es interesante anotar que en tres casos de tuberculosis solo hubo una diseminacion o reactivacion Aunque se ha recomendado o sugerido el uso de la Cortisona como adyuvante de los tres antibioticos en el tratamiento de la tuberculosis y se ha considerado a la enfermedad pulmonar, como respiratoria de Adaptacion (SGA)[6, 7, 8] debe estar el cirujano alerta a la agravacion del proceso tuberculoso pulmonar o a la diseminacion de un foco no pulmonar[29]

En ninguno de los 22 casos hubo problemas de cicatrizacion y las edades extremas fueron, 55 dias y 83 años

SUMMARY

Shock, in some instances irreversible, was treated in 22 cases with intravenous hydrocortisone Complete recovery was obtained in 100 per cent of the cases when the administration of this compound was the only or major antishock measure (11 cases) or when it was administered after all the standard measures used had failed (5 cases) or had given a temporary effect only (4 cases)

It is interesting to point out that in those patients who were given vasoconstrictors, such as levoarterenol or epinephrine, the response was good but temporary—which confirms the theory that adrenal corticosteroids preserve or potentiate the sensitivity of the peripheral capillary bed to vasoconstrictors The response of some patients can be qualified as dramatic, as in Cases 2 and 5 (Figs 1 and 2) in which the blood pressure had fallen and was not perceptible, while the pulse rate had increased in frequency, becoming impossible to count In these cases recovery was achieved in a relatively short time but did not exceed two to three hours, and in the latter administration of blood, desoxicorticosterone, intramuscular cortisone and oxygen had proved useless In other instances, patients, as in Case 8 (Fig 3) the response was not so impressive, since they were less severe—but it was always fast and accurate, the normal arterial tension recuperated only fifteen minutes after the intravenous administration of 100 mg of Cortef

Although in this group of 22 patients there were 2 who died (Cases 8 and 20) this happened several days after the shock had disappeared, and death was due to causes completely unrelated to it

It is interesting to point out that, of the 3 tuberculous patients, dissemination or reactivation was observed in only 1

Although the use of cortisone has been recommended as an adjunct to the three antibiotics for the treatment of tuberculosis and pulmonary disease, considered as a form of adaptation (general adaptation syndrome), it is of the utmost importance that the surgeon be on the alert for any sign of reactivation or any dissemination of a nonpulmonary lesion

In none of the 22 cases was there any problem of healing The ages of the patients ranged from 55 days to 83 years

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In 1643 the body of Pym was opened in the presence of the President of the College of Physicians. Dr. Meverell. Sir Theodore Mayerne. and five other doctors by Chirurgeon Allen, *and Henry Axtall his servant.*

—*Willian Wadd*, circa *1827*

Editorial

Rehabilitation of the Amputee

EVERY doctor is interested in rehabilitation. That is what he means by the word "cure." By that term he means the relief of symptoms, the restoration of function and the return of the patient to his job, to his family, and to the community as a normal person.

In the case of appendicitis, simple fracture or pneumonia, the doctor can achieve this end result with his own bare hands. When a person has lost a leg by amputation, suffered injury to the spinal cord, with paraplegia, or to the brain, with hemiplegia, however, the doctor needs not only his two hands but other hands as well. Unless the doctor's efforts are supplemented by the work of paramedical personnel, such a patient will be left permanently disabled, a burden to the family and community, and unable to assume his rightful place in society.

It is the duty of doctors and professional persons to act as rehabilitation officers; that is to say, their obligation is to resettle these persons in society. They may be temporarily or permanently displaced persons, but they can take their rightful place if we understand and carry out the philosophy of rehabilitation.

The concept of rehabilitation is based on the patient not as an amputee, or a paraplegic, or a compound fracture, but as a whole person. The patient is a farmer; he may have had two years of high school; he is married and has two children; he has hopes and aims and aspirations; he has also a great safety factor. Whatever his disability may be, he is still left with a large reservoir of functions and structures that he can utilize in an integrated way to reassume his normal social obligations. The average human being is like an iceberg; only 20 per cent of his functions are revealed above the surface. Eighty per cent of his traits, qualities and potentialities lie hidden below the surface. The magic of rehabilitation lies not in the technical things doctors do to the patient that permit him to assume independent action, but his own ability to evoke all these hidden resources. This means that the rehabilitation process is not only physical but spiritual, mental and emotional.

Perhaps both the technic and the philosophy of rehabilitation can be illustrated by using the amputee as an example. Formerly the doctor considered his obligation fulfilled when he had amputated a patient's leg. Too frequently the patient had nothing to look forward to but philosophy. The rehabilitation concept regards his cure as a fivefold program.

It begins with psychologic preparation. Not only is an amputation a surgical shock, but it is accompanied by a sense of deep grief or mourning. There is loss of the body image. The sense of deep grief and sorrow is similar to that experienced in the loss of a loved one. In addition to this sense of shock, there are a host of apprehensions, and qualms and anxieties. "What is going to happen to me? Will I ever be able to walk again? Will I ever be able to work again?" It is the doctor's responsibility to answer these questions—

Read at a Regional Meeting of the United States Section, International College of Surgeons, York Harbor, Maine, July 1, 1956

not by a pat on the back but by a constructive course of orientation and psychologic preparation. This means not only showing the patient photographs and motion pictures of other amputees but bringing him into contact with them, so that they can tell their own life story. The bond between two handicapped persons is stronger than that between the doctor and the patient.

The second step in the rehabilitation program is the surgical treatment itself. As the result of war experience it has been learned that the large number of variations in operative procedure are unnecessary; six or more basic procedures are adequate in the majority of cases.

The third step in the program is the care of the stump. The amputation stump is a pathologic organ. It has to be shrunk; contractures must be prevented; contractures when they occur must be corrected. The average patient with a double amputation above the knee will have great difficulty in adjusting himself to wearing the prostheses unless he has good abdominal muscles with which he can learn to balance himself.

The fourth step in the program is concerned with the prosthetic appliance. Considerable research and experience, developed out of the last war, has produced many technical advances in the development of prostheses, but the fundamental principles are the same. No matter what kind of materials the artificial limb is made of, the important thing is the fit. It can be made out of diamonds and rubies, but if it does not fit it is no good. Fit comes first; then comes the design, the alignment, the materials and the weight.

The fifth and final step in the program is concerned with the training of the patient in the use of the prosthesis. It is just as impractical to expect a man to buy a violin and immediately go out and play Bach and Beethoven as it is to put an artificial leg on a man and ask him to walk immediately. The first step in the training program is training him to balance himself, because walking is nothing more than losing balance and regaining balance. After intensive exercises in this field the patient is taught to walk.

Thus, there are five steps in the rehabilitation process. By means of such a technical procedure on the basis of such a philosophic attitude, the future and the hopes of amputees can be changed from futility to productivity and independence.

I have referred to the physical and clinical aspects of the rehabilitation treatment, but this is only one phase of the total program—the phase of physical restoration. The second phase is the vocational guidance and training of the patient.

Regardless of the nature of their disabilities, 20 per cent of all persons can be returned to their former employment; 20 per cent cannot be returned to their former employment but can be retrained in similar or allied employment; 20 per cent may not be able to do competitive work but can work under sheltered conditions; 20 per cent may find it difficult to work even under sheltered conditions but can be trained to take care of their personal needs and to carry out the routine pursuits of life and the activities of living. For only 20 per cent, the severely disabled, must defeat be accepted. Of 100 patients, therefore, regardless of their disabilities, 80 per cent of them can be restored to some degree of function and usefulness.

The philosopher Paulsen said that the object of all help is to make help superfluous. This is the ideal that has pointed the way to surgeons. It is an ideal that can be realized only when surgeons assume a fierce belief in their individual responsibility for what happens to their fellow men.

HENRY H. KESSLER, M.D.,
F.A.C.S., F.I.C.S., D.A.B.
Newark, New Jersey

Abstracts from Current Literature

Mild Coarctation of the Aorta with Normal Blood Pressure Sandifer, S H, Am Heart J 51:761-766, 1956

The author reports 6 cases in which normal blood pressure in the arm was associated with coarctation of the aorta

The latter condition, he states, should be suspected when there is a murmur at the level of the second to the fourth intercostal space, (especially when auscultation indicates it most strongly in the back) even though the blood pressure is normal If the femoral pulses are reduced, either to palpation or by actual measurement, the possibility of coarctation of the aorta is increased Therapy for the mild condition in such cases should be based on the individual patient In the author's opinion, surgical intervention is not necessary on the sole basis of the diagnosis

In 42 per cent of the cases one encounters subacute bacterial endocarditis engrafted upon a bicuspid aortic valve This represents a possible danger, as does bacterial endocarditis near the site of coarctation Surgical treatment is still not necessarily indicated, although an accurate diagnosis is decidely more important even if the condition is mild In the author's opinion, antibiotics should be administered before dental procedures and comparable surgical measures as prophylaxis against endocarditis and endarteritis

Correlation of Gross Gastroscopic Findings with Gastroscopic Biopsy in Gastritis Atkins, L, and Benedict, E B, New England J Med 254:641-644, 1956

To correlate the gastroscopic and the microscopic appearance of gastritis, the authors made a study of 239 biopsy specimens, discovering that, of stomachs with a normal gastroscopic picture, 13 per cent may reveal significant gastritis under microscopic examination

Chronic hypertrophic gastritis, as diagnosed gastroscopically, is associated with a verrucose appearance of the gastric mucosa, but in most cases the histologic picture is within normal limits This would indicate that the verrucose gastric mucosa is probably a variant of the norm and that the term "hypertrophic gastritis" should be abandoned Increased reddening of the mucosa, with edema and adherent secretion, usually diagnosed by the gastroscopist as "superficial gastritis," may also be a variant of the norm, since histologic study revealed either a normal picture or an acute inflammatory infiltrate

In specimens from patients with mixed acute and chronic gastritis, on the other hand, correlation between the gastroscopic and the microscopic picture was possible in some instances (about one-third of the cases) In approximately half of the cases the microscopic picture was normal

The authors conclude that gross gastroscopic observations are not to be relied upon in the diagnosis of gastritis They recommend two preferable alternatives (a) gastroscopic biopsy under direct vision or (b) removal of tissue for biopsy by means of the flexible gastric biopsy tube

Repeat Cesarean Section Barthlomew, R A, Colvin, E D, Grimes, W H, Fish, J, and Lester, W M, Obst & Gynec 7:137-144, 1956

The data presented in this article are based on 162 "repeat" cesarean sections In 4 3 per cent of the cases the cesarean scar had ruptured, in 1 8 per cent rupture was imminent, and in 3 7 per cent rupture was considered not improbable In 62 per cent there were postoperative adhesions, followed in 2 cases by intestinal obstruction In 1 of these 2 cases surgical intervention was necessary

No maternal deaths occurred in this series The uncorrected full term stillbirth and neonatal mortality rates for the primary cesarean sections were 1 6 and 3 2 per cent respectively, the same rates for the premature were respectively 16 6 and 16 6

The authors consider it rather surprising that the stillbirth and neonatal mortality rates associated with the second cesarean section equaled that associated with the first, since maternal complications are more infrequent with the former

In this series, the indications for the initial cesarean section were considered invalid in 21 per cent of the cases

For improvement of the prognosis for future

childbearing, the authors state, employment of the low-segment cesarean section should be advocated and the classic procedure abandoned. Restriction rather than enlargement of the operation should be the surgeon's object, since the healing of the incision is difficult to control and the possible weakness of the scar is well known.

Strong emphasis is laid on the necessity of careful appraisal of the possible risks of future childbearing before it is decided to perform cesarean section. In the authors' opinion the lay public is much in need of education on this subject, since a well-informed patient would be likely to insist upon such an appraisal.

Persistent Invagination of Meckel's Diverticulum. Towbin, A., Arch. Surg. 72:673-677, 1956.

The role of Meckel's diverticulum in the production of intestinal obstruction is becoming more and more widely acknowledged. Formerly regarded by some as a harmless congenital anomaly, this lesion has proved to be a mischief-maker of the first order and is often the cause of one or another, of a number of serious intestinal diseases.

Obstruction of the intestine from this cause is commonest in the adult and is generally considered an acute surgical disease. The author questions the validity of this conclusion, expressing the opinion that the condition may be chronic. He recalls the efforts of former authors to establish this possibility as a fact and the failure of these efforts because of the lack of positive pathologic evidence. He reports a case of his own in which, in his opinion, the pathologic evidence was conclusive.

The patient was a young adult who, under observation for two months, had repeated attacks of total intestinal obstruction. Operation revealed an obstructing mass in the ileum, which proved to be an inverted Meckel diverticulum. This lesion, with the passage of time, had developed into a lipomatous ileal polyp. Pathologic study of the specimen confirmed the author's theory.

The author freely acknowledges that the case is uncommon, but maintains that Meckel's diverticulum as a cause of chronic intestinal obstruction should be given serious consideration in the clinical study of all patients, particularly the male, who have recurrent or protracted seizures of intestinal obstruction.

Intravenous Chlorpromazine in Postoperative Gynecologic Patients. Corbit, J. D., Obst. & Gynec. 7:125-149, 1956.

Chlorpromazine as employed in the postoperative care of gynecologic surgical patients is the subject of this report, which is based on a series of 50 patients who had undergone abdominal operations, in most cases total hysterectomy. Twenty-five were given chlorpromazine; the remaining 25 were used as controls.

It was observed that the women in the chlorpromazine-treated group needed fewer doses of narcotics (by 39 per cent) and used 46 per cent less than did the controls; that postoperative distention of the abdomen was greatly reduced in the treated group; that the patients in this group did not vomit, were in most cases able to leave their beds on the day following the operation, and showed no significant alterations in blood pressure.

The author points out that no final conclusions can be drawn on the basis of this small series. He suggests, nevertheless, that the results seem promising. He proposes to conduct a further study of the possibilities of this drug as an adjunct to postoperative management in such cases.

Appraisal of Progress in Surgical Therapy. Rogers, C. S., and Fitts, W. I., Surgery 39: 367-370, 1956.

The author reports on a series of 46 cases of primary inflammatory carcinoma of the breast, classified according to the principal therapy employed. Eight years after radical mastectomy, 1 patient was living and well at the time the report was written. All previously reported five-year survivals were those of patients who had also undergone radical mastectomy.

Although by many surgeons inflammatory mammary carcinoma is considered inoperable, the authors of this article consider radical mastectomy justified; in their opinion, in view of the fact that this condition is highly lethal in any circumstances, the data reported in the literature furnish inadequate support of the objections. If there is no evidence that the carcinoma has spread beyond the area included in a reasonably radical mastectomy, they do not hesitate to perform it.

Operative Cholangiography. Weir, R A, and Lizama, C, Missouri Med 53.280-284, 1956

The authors describe two technics of operative cholangiographic procedure, listing the advantages and disadvantages of each Neither method requires special instrumentation An angled needle, devised and described by the authors, can be made from an ordinary No 22 B-D hypodermic needle

The use of cholangiographic studies made during operation is increasing Of 232 cholecystectomies performed during 1953, 1954 and 1955, operative cholangiographic studies accompanied 83 The common duct was explored in 52 instances, and in 1 case seventeen stones were removed Of these, 7 6 per cent had been left from earlier exploratory operations on the common duct The operative mortality rate was low—0 8 per cent—and the morbidity rate was minimal

The authors recommend the taking of operative cholangiograms as a routine in all operations on the biliary tract After all surgical explorations of the common duct, control cholangiograms should be taken within twelve days after the operation, before any attempt is made to remove the T tube

It is also advised that neither removal of the gallbladder nor interference with its blood supply be undertaken until after a complete study of the common duct has been made If there is a lesion of this duct, the presence of the gallbladder may save the patient's life Both methods described by the authors can be used without affecting the integrity of the gallbladder or its blood supply

It is pointed out, however, that the taking of cholangiograms during operation is a matter of great precision and must be done with absolute accuracy The authors consider it necessary that the entire operating team be acquainted with one or two technics, at the minimum

Surgical Treatment of Sinusitis Associated with Asthma. Grove, R C, New York State J Med 56:726 728, 1956

Suppuration is infrequent in cases of the hyperplastic type of sinusitis usually associated with asthma, unless the infection is temporarily exacerbated

In the author's opinion, sinusitis in itself is a frequent cause of asthma, and the administration of antibiotics and steroid hormones is, in most cases, merely palliative Surgical intervention is indicated, but the patients must be carefully selected If operation is performed, complete removal of the infected sinus membrane is the desideratum

The author presents data on a series of 300 patients with asthma and sinusitis treated by the operation he describes, with follow up examinations for periods varying from six months to twenty three years In 69 3 per cent the asthma was greatly improved

Emphasis is laid on careful preliminary diagnosis

Emergency and Definitive Treatment of Bleeding Esophageal Varices Linton, R R, and Ellis, D S, J A M A 160·1017-1023 (March 24) 1956

Bleeding in the upper part of the gastrointestinal tract is frequently due to esophageal varices, moreover, it is often fatal in persons with portal hepatic cirrhosis The seriousness of esophageal hemorrhage in the presence of this condition is fully recognized today

Transthoracoesophageal suture of the varices was performed upon 20 emergency patients with hepatic cirrhosis Two, or 10 per cent, died during the operation Three or 15 per cent, died later In the remaining 15 (75 per cent) a splenorenal or a direct portacaval shunt was created after a lapse of time In the authors' opinion this method is the treatment of choice for patients with esophageal hemorrhage so severe as to require cardioesophageal tamponade

The construction of a splenorenal or a portacaval shunt is the most effective treatment yet available Of 78 patients so treated and followed for periods varying between one and eight years, recurrent bleeding was observed in only 13 (17 per cent) Even of these, the bleeding in 4 was minor Fifty-two (67 per cent) of the total original group were able to engage in gainful work, 17 (22 per cent) were able to work on a part time

basis, and only 7 (9 per cent) were incapacitated for work because of advanced age or cardiac weakness.

As an emergency measure to control massive hemorrhage from esophageal varices, cardioesophageal tamponade with an intragastric ballon is recommended. This should be supplemented at once by transpleural transesophageal suture of the varices.

The best definitive treatment is the c ation of a shunt as aforementioned, to div the portal venous blood into the systen venous circulation. Success with these ope tions depends upon close cooperation of t surgeon with the anesthetist and the inte ist.

It is, perhaps, unduly optimistic to say that rough surgery is extinct to-day. Human nature, and especially adolescent human nature as exemplified by the medical student, will always prefer the spectacular to the artistic, and the gentle surgeon is often a gentle man. He may find, to his chagrin, that the best students flock where the blood flows most freely, where the shouts are the loudest, where instruments are thrown about the theatre, where 'look and see', the infallible solvent of diagnostic difficulties ensures an abundant succession of *tours de force*. Yet he has his reward when the same men, older and wiser, come to him as house surgeons and registrars to learn those details of tissue kindness which are unseen from the gallery. For this Hiltonian surgery is taught and propagated by apprenticeship. Men speak of Halsted technique. Lane technique, Moynihan technique. each meaning the same thing, the standard of work of a great master at whose side he has studied, a standard whose only criterion is that the tissues shall be treated with the greatest gentleness, subjected to the least damage, replaced carefully, apposed accurately—in short, that they shall bear the least trace of the surgeon's passage. Such methods gain adherence by their results rather than their performance. Their victory is symbolized by the disappearance of the old operating 'theatre,' suited for the dramatic in surgery. and its replacement by what is almost an operating temple. where the faithful can study essential detail. Their performance is made possible by better anaesthesia and more highly skilled assistance, which have eliminated the need for hurried work, so that only its quality need be considered. Their perpetuity is assured by a new school of young men, trained in the use of their hands at a time when they can acquire the touch of an artist.

—*Ogilvie*

New Books

Books Received.—The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

Textbook of Medicine. Edited by Russell L. Cecil and Robert F. Loeb. Philadelphia and London: The W. B. Saunders Company, 1955. Pp. 1786, with 200 illustrations. *Reviewed in this issue.*

The Premarital Consultation: A Manual for Physicians. By Abraham Stone and Lea Levine. New York and London: Grune & Stratton, 1956. Pp. 90, with occasional illustrations. *Reviewed in this issue.*

Love or Perish. By Smiley Blanton. New York: Simon & Schuster, 1956. Pp. 217. *Reviewed in this issue.*

The Office Assistant in Medical and Dental Practice. By Portia M. Frederick and Carol Towner. Philadelphia and London: The W. W. Saunders Company, 1956. Pp. 350, with 44 illustrations. *Reviewed in this issue.*

J.A.M.A. Clinical Abstracts of Diagnosis and Treatment. New York and London: International Medical Book Corporation, with Grune & Stratton, Inc., 1956. Pp. 661.

J.A.M.A. Queries and Minor Notes. St. Louis: The C. V. Mosby Company, 1956. Pp. 334.

Plastic Repair of Genito-Urinary Defects. By George Bankoff. New York: The Philosophical Library, 1956. Pp. 345, with 86 illustrations.

The Treatment of Fractures. By Lorene Bohler. New York and London: Grune & Stratton, Inc., 1956. Vol. 2, translated from 13th German edition. Pp. 1072, with 1,721 illustrations.

Pulmonary Uptake of Oxygen, Acid-Base Metabolism and Circulation During Profound Apnea. By Martin H-son Holmdahl. Stockholm, Sweden: Acta Chirurgica Scandinavica Supplementum 212, 1956. Pp. 128, with 36 illustrations. *Reviewed in this issue.*

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 374, with 145 illustrations.

Tumors of the Skin. By Herbert Conway. Springfield, Ill. Charles C Thomas, Publisher, 1956. Pp. 267, with 178 illustrations, 3 in color.

Studies in Anemia of Injury. By Lars-Eric Gelin. Stockholm, Sweden: Acta Chirurgica Scandinavica Supplementum 210, 1956. Pp. 130, with 58 illustrations. *Reviewed in this issue.*

Supplement 1, Atlas of Exfoliative Cytology. By George N. Papanicolaou. Cambridge, Mass.: Harvard University Press, 1956. Loose-leaf format, published for The Commonwealth Fund.

Handbook of Physical Therapy. By Robert Shestack. New York: Springer Publishing Company, Inc., 1956. Pp. 212.

Cirurgia: Trabalhos da la Cadeira de Clinica Cirurgica da Universidade do Brasil (Surgery: Proceedings of the Cadeira de clinica Cirurgica of the University of Brazil). Edited by Alfredo Monteiro, with the collaboration of Eugenio de Souza, Carlos Gomes dos Santos, Ruy Archer, Diomedes Ferreira, Olimpio de Freitas Costa Neto, Newton Salim, Ricardo Castra Paiva, Humberto Barreto, N. de Almeida Aguilar, Otavio B. Tourinho and Alcides Modesto Leal. Rio de Janeiro: Rivista Brasileira de Cirurgia, 1955. Pp. 188, with 106 illustrations.

This is an admirable compendium of surgical knowledge, beginning with a brief history of the evolution of anesthesia by Prof. Monteiro, who also contributes the first chapter, *The Errors and Dangers of Biliary Surgery.* In this dissertation he emphasizes the danger of hemorrhage and of injury to the common duct resulting in stenosis. The second chapter, *Alcoholization of the Subarachnoid Space,* This method as employed for the treatment of certain types of intractable pain is described by Prof. de Souza and illustrated with seven excellent line drawings. Chapter 3, by Prof. Carlos Gomes dos Santos, is entitled *Recovery Room: Installation and Functions.* The value of such an accessory to convalescence is clearly outlined and the necessary equipment and technics described, as are the most common accidents and complications during the "critical" postanesthetic period.

In the next chapter, *Exploratory Laparotomy,* Prof. Dr. Ruy Archer sets forth the technic of exploring the abdominal cavity and of surgical intervention for penetrating wounds and other abdominal traumatic lesions. The lesions of each organ are studied in detail, and the text is illustrated with twelve artist's sketches of the various technical procedures. Prof. Dr. Diomedes Ferreira in Chapter 5, *A case of Congenital Dysmorphia of the Female Genitals,* presents what is apparently a unique instance of congenital defect. Eleven illustrations, including photographs, photomicrographs and drawings, are included.

Prof. Dr. Olimpio de Freitas Costa Neto, in the chapter *A Contribution to the Surgical Treatment of Megacsophagus,* discusses the etiologic, pathologic and therapeutic aspects of this condition. He advocates clinical treatment at first; if this does not suffice, Heller's operation is recommended. Fourteen well executed drawings illustrate the text.

The chapter "Control of Hypotension in Thyroidectomy" is contributed by Prof. Drs. Ricardo de Castro Paiva and Newton Salim. It describes a technic which, in a series of 30 cases, has reduced bleeding, prevented postoperative hemorrhage, reduced the need of anesthetic drugs and strikingly lessened pulse pressure during the operation.

Prof. Drs. Humberto Barreto and N. de Almeida Aguilar present the results of an intensive study of varicose veins. They offer pertinent suggestions as to the combination of certain well-known tests, finding this preferable to the use of any one test alone. Prof. Dr. Alfredo Monteiro, in whose service the two authors last mentioned carried on their studies, contributes an important chapter on splenectomy, including indications, technic and certain technical failures. His own technic is clearly illustrated by drawings. The next chapter, which deals with cholecystectomy, is also the work of Prof. Monteiro and is equally stimulating, well illustrated and significant.

Hernia of the esophageal orifice is discussed by Prof. Dr. Octavio B. Turinho, who makes liberal use of roentgenograms as illustrations. Two cases are reported in detail.

Prof. Monteiro's name reappears at the head of the chapter on portal hypertension, which he presents at length and in meticulous detail, with surgical drawings to explain the technic and a list of 36 references to other well-known authors. In the next chapter Prof. Barreto also reappears, this time in collaboration with Prof. Dr. Alcides Modesto Leal. Their presentation on the subject of transverse abdominal incisions is based on 210 cases of supramesocolic and inframesocolic intervention. They favor the transverse incision for abdominal procedures but recognize the value of the vertical incision for celiotomy.

Prof. Dr. Eugenio de Souza, who has written both the penultimate chapter and the final one, offers in the first of these a most interesting description of various surgical uses of modified sewing machine attachments and devices, recommending the von Piser tweezers, with certain modifications worked out by himself, as the best such instrument available.

The final chapter is written by Prof. Drs.

Armando P. Monteiro and Daniel José Sili, on the subject of the Souza clamp as employed in gastrectomy for securing the duodenal stump. Like the other chapters, it is well presented and illustrated.

This reviewer is indebted to Prof. Dr. Monteiro for the gift of an autographed copy of *Cirurgia*, an important and valuable collaborative contribution to current surgical knowledge and one that bears on every page the mark of his outstanding talent as editor. The considerations set forth in these pages cover a wide field, and each of them, in its own sphere, is excellent.

M. T.

On Antibodies Separated by Paper Electrophoresis, with Special Reference to the Wassermann Reagins. By Anna Brita Laurell. Acta Pathologica et Microbiologica Scandinavica Supplementum 103, Copenhagen: Ejnar Munksgaars, 1955. Pp. 92, with 41 illustrations.

The author reports the results of her study of antibodies by means of paper electrophoresis. She discusses first, in general, the problem concerning Wassermann reagents.

Part I of the work deals with the fractionation of antibodies by preparative paper electrophoresis. The author was able to show that a number of antibodies, including typhoid agglutinins, etc., are associated with gamma globulin, while agglutinins against Salmonella typhi H and Salmonella typhi murium H migrate faster then do the bulk of gamma globulin.

Part II deals with the presence of Wassermann reagins in human serum. The author was able to demonstrate that gamma globulin preparations from serologic negative human serum reactions in standard tests for syphilis.

Part III deals with the Wassermann reagents in electrophoretically fractioned normal, syphilitic and biologic false positive serum. After fractionation, the biologic false serum specimens proved to be of three types, with reagins associated with gamma globulin only, with the beta$_2$ globulins only or with both. In cases of primary syphilis the reagin was associated only with the gamma globulin, while in cases of late syphilis, it was associated with beta$_2$ globulin only or with both.

No difference was observed between syphilitic specimens of serum and specimens of biologic false positive serum, with regard to the rate of morbidity of the reagins. It therefore appears that a verification test based on electrophoretic fractionation of serum will not be valuable.

This reviewer considers the monograph an interesting piece of work, of value to anybody interested in the problems of biologic false serologic reactions.

WERNER F. EISENSTAEDT, M.D.

The Office Assistant in Medical and Dental Practice. By Portia M. Frederick and Carol Towner, Philadelphia and London: W. W. Saunders Company, 1956. Pp. 350, with 55 illustrations.

The need of a detailed manual of procedure for those who assist physicians, surgeons and dentists in the office, in the library, in their prodigious and continual correspondence, and in such mundane matters as the keeping of their professional accounts has long been obvious. No less obvious has been the need of specific instruction to office, editorial and research assistants whose work lies with organizations of physicians, surgeons, dentists and health authorities. All of these fields are efficiently covered in the book at hand.

The authors have neglected no phase of the routine; beginning with a brief explanation of professional ethics, as necessary to the doctor's staff as to himself, they proceed to instruct the assistant as to public relations, telephone technic, medico-legal questions, the handling of appointments, the management of mail, the making and filing of vital records, the collection of fees, bookkeeping in general, the facts about accident and health insurance, and the technics of assisting the doctor in examining his patients. The care of instruments and the principles of sterilization are included; the principles of immunology are outlined, as are those of physical therapy. There is an excellent chapter on office "housekeeping" and the management of supplies.

The chapter on editorial duties is too short to present more than a glance at the multitudinous duties involved therein; but this is to be expected, since an entire book larger than this one would not contain them all. In all other fields the book should prove a blessing to the harried doctor who has not the time to instruct each new staff member fully and must therefore wait with what patience he can until experience has taught her what she needs to know.

Textbook of Medicine. Edited by Russell L. Cecil and Robert F. Loeb. Philadelphia and London: The W. B. Saunders Company, 1955. 9th ed. Pp. 1786, with 200 illustrations.

The new edition of this large compendium of medical information is offered by its editors with the assistance of three associate editors and 173 contributors. It goes without saying that the bulk of the material included is immense. It has nevertheless been expertly handled as to writing, editing, chapter sequence and the like, and is implemented by an index covering 97 pages.

The major divisions, since lack of sufficient space precludes mention of the minor ones, cover in succession the infectious diseases, including some of unknown causes; diseases of allergy; collagen diseases; diseases due to physical agents; deficiency diseases due to chemical agents; and diseases of metabolism; diseases of the ductless glands; diseases of the digestive tract, the respiratory system, the kidneys, the spleen and reticuloendothelial system, the blood, the cardiovascular system, the locomotor system, the nervous system, brain and spinal cord (including hereditary, familial and congenital pathologic conditions), with substantial comment on psychosomatic medicine and psychotic illness. Each of these main divisions is subdivided and resubdivided into as many sections as thorough discussion requires.

Some portions of this massive work are necessarily synoptic, but all are well and lucidly written, and a wealth of knowledge, significant and up to date, is the result. The editors have carried out their purpose of eliminating what has been outgrown and including, in this ninth edition, much that has been learned since the eighth edition appeared in 1951. They are to be congratulated for maintaining on so high a level the value of a work that has long since established its place as a textbook of medicine.

M. T.

The Neurosurgical Alleviation of Parkinsonism. By Irving S. Cooper. Publisher, Charles C Thomas, Springfield, 1956, Pp. 104.

This book brings together Dr. Cooper's previous articles on the treatment of parkinsonism by occlusion of the anterior choroidal artery and injection of alcohol into the globus pallidus (chemopallidectomy). There is a brief but excellent historical review of the various surgical attempts to alleviate this condition.

The discussion of the pathologic anatomic and physiologic picture is oversimplified and can be recommended only as an introduction to the author's procedures. The major portion of the book is taken up by the technical description of anterior choroidal artery ligation and injection of alcohol into the globus pallidus. The simple guide the author uses for the injection of alcohol into the globus pallidus is described. These chapters are clear, concise and well illustrated. A series of illustrative case reports follows the description of each method.

The book is well written and illustrated. The publisher has permitted the use of large illustrations and used a large, legible type that makes perusal of the book a pleasure to the reader.

This book will be of interest to all concerned with parkinsonism, though to this reviewer it seems oversimplified and dogmatic, and it must be emphasized that the technics described demand extensive anatomical knowledge and considerable neurosurgical experience and skill. Further, as the author points out, there is still much to be learned about this disease, and at present the surgeon can only alleviate the condition or retard the development of its distressing symptoms.

HAROLD C. VORIS, M.D.

Pulmonary Uptake of Oxygen, Acid-Base Metabolism, and Circulation during Prolonged Apnea. By Martin H-son Holmdahl. Stockholm: Acta Chirurgica Scandinavica Supplementum 212, 1956. Pp. 128, with 36 illustrations.

This monograph deals, in the first part, with observations made over prolonged experimental periods of apnea with uninterrupted pulmonary uptake of oxygen. The writer calls this oxygenation of the blood in the absence of tidal exchange "apneic diffusion oxygenation (ADO)."

After a period of denitrogenation, apnea was induced by administration of intravenous succinylcholine and was continued for thirty minutes. Owing to carbon dioxide intoxication, respiration was not resumed spontaneously and artificial respiration was instituted, either at a predetermined time or when a sudden severe fall in blood pressure occurred.

In a brief summary of the data obtained, it can be stated that the blood pressure, after

a slight depression, rose after five to ten minutes The oxygen uptake fell considerably There was an increase in the hematocrit readings, and the levels of hemoglobin, and marked acidosis developed

A number of experimental animals that survived a one hour period of ADO showed no permanent disabilities In general, it was also established that, during the period of apnea, there was a marked increase in carbon dioxide

The author discusses further clinical applications of ADO for six minutes This brief period was considered safe for human subjects It appears to this reviewer that the method is still in the experimental stage and that any clinical application at this stage is premature

The monograph represents an industrious study and is a worth while contribution to respiratory physiology

WERNER F EISENSTAEDT, M D

The Premarital Consultation: A Manual for Physicians By Abraham Stone and Lee Levine New York and London Grune & Stratton, 1956 Pp 90, with occasional illustrations

The custom of consulting one's physician before marriage is increasingly widespread, and this manual therefore meets a need The authors themselves refer to it as an extension of preventive medicine to the family unit, and they deal with it on a sound basis of experience Dr Stone is past president and co founder of the American Association of Marriage Counselors, and Dr Levine is a practicing gynecologist and psychiatrist Both have had much personal contact with troubled persons entering upon marriage with an earnest desire to make it successful, as well as with persons already married and in difficulties

Naturally, therefore, the manual is well organized, beginning with the questions most frequently asked and suggesting effective answers In subsequent chapters the physical process of reproduction is described in detail and illustrated with line drawings where they are needed Although the chief emphasis is laid, as it should be, on the psychic problems of the married state, the physical implications are never neglected

Though the subtitle describes the work as a manual for physicians, it could be read with profit by any intelligent young man or woman One of its chief benefits to the professional man is the fact that it will serve him as a reminder of many aspects of the matter that may otherwise slip his mind It is to be recommended without reservation to all who are giving study to this vital topic

M T

Studies in Anemia of Injury. By Lars-Eric Gelin Stockholm Acta Chirurgica Scandinavica Supplementum 210, 1956 Pp 130, with 58 illustrations

This is a monograph presenting clinical data and experimental work on the anemia of injury The author undertook extensive laboratory examinations, which included hemoglobin determinations, blood cell counts, eosinophil counts, platelet counts, reticulocyte counts, serum iron determinations, bilirubin determinations, urobilin determinations, sedimentation rates, total protein levels, fractionation, fibrinogen and capillary microscopic study

The examinations were done on 168 patients with fractures of the legs Similar experimental work was done on a number of rabbits, in which fractures, contusions and burns were artificially induced In general, the experimental results agreed with the clinical material The author comes to the conclusion that the amount of hemorrhage cannot explain the anemia associated with injury Neither was there any convincing evidence that impaired erythropoiesis or hemolysis explains it

By means of capillary microscopic study the author observed decreased stability of the blood, leading to aggregation of erythrocytes with erythrostasis in the postcapillary venules The result of this was the withdrawal of red cells and hemoglobin from the effective circulation

The author considers the last mentioned observations a satisfactory explanation for the anemia associated with injury

The experimental work was carefully done, although to this reviewer it seems that it could have been brought out more precisely if there were included either in the clinical material or in the experimental data any evidence of "clinical shock" The observations are such as can be expected in the presence of mild shock All in all, however, this monograph is an interesting contribution to the pathology of injury

WERNER F. EISENSTAEDT, M D

Love or Perish. By Smiley Blanton. New York: Simon & Schuster, 1956. Pp. 217.

Although written primarily for the laity and in simplified terms, this exposition of love as a necessity of life contains much that should interest members of the profession—not from the professional point of view, since the simple psychiatric facts are common knowledge in many fields besides psychiatry—but because the preternaturally busy life of a physician or a surgeon is apt to lead him into neglecting this need, both in his own life and in the lives of others.

Dr. Blanton has successfully steered clear of the pseudo-Freudian nonsense the characterizes so many popular presentations of psychiatric data. With equal success he has avoided the marshes of sentimentality, and there is no mistaking the fact that his definition of the word "love" is generously wide. Nowhere in the book will the reader find the currently popular notion that sexual satisfaction per se is the goal of living; it is clearly explained that love for a friend, a husband, a wife, a child, a parent, a cause or even one's daily work can supply what man needs to keep his soul alive.

Those who are concerned about the perilous state of the world at present will be glad to see emphasis placed on another important truth: that work can be successful and satisfying *only* when it is done with love. Dr. Blanton illustrates this point with analogies drawn from employer-employee relations, but it is equally applicable to every activity of the human being.

M. T.

To gnash or grind the teeth, unless this has been a habit from childhood, is a sign of madness and death. If a patient who is already out of his mind does this, then it is certainly fatal. It is also fatal when the teeth become dry.

Mortification of a tooth brings an end to a gingival abscess.

When severe fever and delirium supervene on mortification of a tooth, it is a sign of death. If recovery takes place, there will be suppurating ulcers and sequestration of the bone.

There is the danger, when there is violent pain in the jaws, that there will be sequestrum formation in the bone.

Pursing of the lip denotes a bilious flux of the bowels.

Bleeding from the gums on top of relaxed bowels is a fatal sign.

—*Hypocrates*

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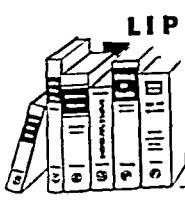

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General Surgery

Peptic Ulcer

Perforation and Hemorrhage; Choice of Operation

MOSES BEHREND, M.D., F.A.C.S., F.I.C.S.*

PHILADELPHIA, PENNSYLVANIA

PEPTIC ulcer, whether it attacks the duodenum or the stomach, has been a subject of controversy for the past fifty years or more. The causes, the method of treatment (medical or surgical) the type of operation that should be performed, and the question whether there shall be an operation at all have been subjects of discussion for a long time. In the first ten years of this century, controversial arguments as to whether peptic ulcers should be treated medically or surgically became so heated that the partisans made the walls of the hall tremble with their oratory. This has continued through the years with less fervor, however, because almost everyone concedes now that peptic ulcer should be given a fair chance with medical treatment. My own opinion is that too much time is wasted in the prolonged medical treatment of these ulcerations. The best results are obtained by early operation. One should not wait until scar tissue at the pylorus causes obstructive symptoms. Again, operation is a prophylactic measure against perforation and hemorrhage.

In 1930 I published a paper on gastric and duodenal ulcers and stated at the time that perforated ulcers usually do not bleed and bleeding ulcers do not perforate. This was a statement open to reservations,

Read at a meeting of the Eastern Section of the International College of Surgeons York Harbor, Maine, July 6, 1956
*Consulting Surgeon, Einstein Medical Center Associate in Surgery, Jefferson Medical College Philadelphia
Submitted for publication July 27, 1956

because one could not lay down hard and fast rules concerning any medical or surgical condition. There are exceptions, because some perforated ulcers have bled at the time of perforation, and, *vice versa*, some hemorrhagic ulcers have perforated. By and large, however, the protocol as stated before concerning perforated and hemorrhagic ulcers still holds.

Gastric and Duodenal Hemorrhage.—Hemorrhages from peptic ulcers always instill into the physician a certain amount of fear. Often there may be no previous history of ulcer. Hemorrhage may occur from many sources, such as the esophagus, the stomach, the duodenum, the large and small intestines or a cirrhotic liver. Treatment of hemorrhage from peptic ulcer has divided the profession into two camps—the conservative and the radical group. Welch, Allen and Donaldson recommend operating on bleeding ulcers after the first massive hemorrhage, because, in their opinion, bleeding recurs. This side of 40 years of age it may be reasonable to wait and treat the patient medically for a while, with transfusion, and perform the laboratory work that is indicated. If the patient is past 40 it is a little dangerous to wait, on account of arteriosclerosis of the blood vessels. In cases of repeated hemorrhage due to peptic ulcer at any age one should always operate. Several years ago it was impressed upon me how dangerous it is to wait, hoping that the ulcers will stop bleeding. One man over 40 and another patient under 40 were apparently safe at the time of afternoon hospital rounds. During the night, however, bleeding must have continued, for they were dead by the next morning. I have always been a radical when hemorrhage from the gastrointestinal tract is present. When the blood has been replaced, the sooner one operates upon the patient the better.

When operating upon patients with hematemesis and/or melena, one sometimes discovers lesions not related to peptic ulcer, which require operation to save the patient's life. A woman about 45 years old had hematemesis and bloody stools that could not be controlled. After the blood had been replaced, she was operated upon. The stomach and duodenum were perfect. It was necessary to examine the entire intestinal tract twice before I discovered the cause of bleeding—a small white pimple on the surface of the first portion of the jejunum. This was excised, and in the middle of the ulcer was a clot of blood. The patient made an uneventful recovery, and is living and in good health at the time of writing.

Acute gastritis may give rise to severe bleeding from the stomach as a result of many small, frequently invisible punctate ulcers. In such cases, the surface of the stomach bleeds almost throughout its entirety. Resection of the stomach has invariably stopped the bleeding and cured the patient.

Treatment of Perforated Ulcers Without Operation.—There are now many advocates of the nonoperative treatment of perforated peptic ulcer. Many active surgeons of large experience have inadvertently treated perforated ulcers by this method, perhaps because of a mistaken diagnosis. The greatest advocate in this country is Sam F. Seeley, M.D., who reported on 139 patients treated by the nonoperative method from October 1945 to December 1953. His results were very good. On one of the cruises of the International College of Surgeons, it was my privilege to make rounds with Dr. Iselin of Paris. He showed the group 3 patients who had been treated conservatively. They were symptomless, with the exception of some residual tenderness and rigidity. He stated that he had employed this treatment in 30 earlier cases.

Choice of Operation.—In the early part of 1900 a favorite operation for duodenal ulcer was a gastroenterostomy with the so-called exclusion operation around the

pylorus It was considered good surgical technic to use plication sutures around the pylorus in a circumferential manner, so that food could not pass through the pylorus but instead would go by means of the short circuit, namely, the gastroenterostomy This operation was extensively used by W W and C H Mayo, John B Deaver, John B Murphy, and many other famous surgeons of that period It was soon discovered, however, that the exclusion operation did not answer the purpose It was ineffective in preventing food from passing through the duodenum

Posterior gastroenterostomy was a good effective procedure, from which patients received great comfort as a result of the neutralization of the acids in the stomach by the alkalies in the jejunum The greatest argument against the posterior gastroenterostomy without resection was that secondary ulcers developed at the site of anastomosis, but when one considers the number of secondary ulcers that now follow the Polya or the Hofmeister operation, one notes that there is little difference in the incidence of ulcers following a simple gastroenterostomy as compared to that following the more complicated operations Up to a few years ago the latter technique was the routine I followed

At the time of perforation should the surgeon close the defect or resect the stomach and do a Billroth I or II operation? Zollinger and Williams reported 194 operations performed for peptic ulcer in which they employed Billroth I and II with very good results When the Billroth I operation is performed it is followed by vagotomy In the majority of cases the conservative operation of closure of the perforation is usually performed instead of a resection of the stomach

Nowadays, whenever it can be performed, depending on the interval between the time of perforation and the time of operation, subtotal resection is performed followed by a Polya or a Hofmeister procedure Immediate radical resection of the stomach is safe, I have had no deaths following this procedure The proper cases, however, must be selected for this operation If simple closure is used, it may be necessary at some future time to do the major operation for recurrent symptoms of ulcer Bisgard advocates immediate resection, because in 70 per cent of the cases in which a simple closure was made symptoms of ulcer developed Recently, performance of the Billroth I operation after the ulcer has been excised has been advocated, and a resection of the stomach performed Many years ago this was the operation of choice, and I performed exactly that If there is too much space between the excised portions, it is better to perform a Billroth II The Billroth I operation is recommended whenever it can be performed

Procrastination in the treatment of ulcers is rather dangerous especially when the ulcers occur on the posterior wall of the stomach They are usually malignant, although some operated upon have been benign They are usually large, sometimes 1 or 2 inches (2 5 to 5 cm) in diameter They may become adherent to the pancreas, and are difficult to remove In many instances the ulceration must be left on the anterior surface of the pancreas When the stomach is mobilized, a large deficiency results in its wall Resection of most of the stomach must then be performed The remaining ulcer can be destroyed by fulguration or covered with a piece of fat

Vagotomy—Volumes of literature have accumulated on the pros and cons of vagotomy for peptic ulcer Space does not permit me to enter into a discussion of the efficiency of this operation My opinion can only be based upon what I have read and on the [illegible] of others at medical meetings I [illegible] it practical [illegible] I perform

to me an illogical operation, because, in addition to the vagotomy, one is almost always compelled to perform a posterior gastroenterostomy.

Although Dragstedt was not the first to advocate this operation, he deserves the credit for making the medical profession conscious of the fact that an operation of this type may be beneficial in healing peptic ulcers. Most surgeons consider vagotomy useful for its beneficial effect on gastrojejunal ulcer.

CONCLUSIONS

1. Controversy as to the treatment of peptic ulcer still exists.
2. Too much time is wasted by medical treatment leading eventually to perforation, hemorrhage and obstruction.
3. Opinions differ among surgeons as to the best time to operate for hemorrhage resulting from peptic ulcer.
4. Simple massive hemorrhage should be followed by operation. Repeated hemorrhage makes operation a necessity.
5. Perforated ulcers can be treated by simple closure of a perforation, massive resection of the stomach or no operation at all.
6. In the early 1900's, simple gastroenterostomy was the operation of choice. At present, the Billroth I and II and gastric resection, followed by the Polya or Hofmeister type of operation, are performed.
7. Vagotomy with posterior gastroenterostomy has become a popular operation. The author states that he has never performed vagotomy.

CONCLUSOES

1. A controvérsia quanto ao tratamento da úlcera péptica ainda existe.
2. Perde-se ainda muito tempo com o tratamento médico que eventualmente leva à perfuração, hemorragia e obstrução.
3. As opiniões entre os cirurgiões diferem quanto ao melhor tempo para se operar a hemorragia resultante da úlcera péptica.
4. A hemorragia maciça simples deveria ser acompanhada de operação. A hemorragia, repetida torna a operação uma necessidade.
5. Pode-se tratar úlceras perfuradas pelo simples fechamento de uma perfuração ressecção maciça do estômago ou nenhuma operação.
6. Nos princípios de 1900, a simples gastroenterostomia era a operação de escolha. Atualmente, a Billroth I e II e a resecção gástrica, acompanhadas pela operação do tipo Polya ou Hofmeister são feitas.
7. A vagotomia com gastroenterostomia posterior tornou-se uma operação popular. O autor declara que nunca fez a vagotomia.

SCHLUSSFOLGERUNGEN

1. Der Streit um die Behandlung des peptischen Geschwürs ist noch in vollem Gange.
2. Es wird zu viel Ziet mit medizinischer Behandlung verloren, was schliesslich zur Perforation, Blutung und Obstruktion führt.
3. Die Meinungen der Chirurgen über den besten Zeitpunkt der Operation wegen Blutungen eines peptischen Geschwürs sind geteilt.
4. Die einfache massive Blutung sollte operativ behandelt werden. Wiederholte Blutungen machen den chirurgischen Eingriff zur Notwendigkeit.
5. Durchgebrochene Geschwüre können mittels einfachen Verschlusses der Perforation, mit massiver Magenresektion oder auch ohne operativen Eingriff behandelt werden.
6. Im Anfang unseres Jahrhunderts war die einfache Gastroenterostomie die Operation der Wahl. Zurzeit werden Resek-

tionen nach Billroth I und II, gefolgt von der Polyaschen oder Hofmeisterschen Operation, ausgefuhrt

7 Die Vagotomie mit einer hinteren Gastroenterostomie ist ein sehr beliebtes Verfahren geworden Der Verfasser bemerkt, dass er niemals eine Vagotomie ausgefuhrt hat

CONCLUSIONS

1 La controverse sur le traitement de l'ulcere peptique n'est pas terminee

2 Le traitement medical fait perdre un temps precieux, il peut conduire a la perforation, a l'hemorragie et a l'obstruction

3 Les opinions different quant au meilleur moment pour opérer en cas d'hemorragie par ulcere peptique

4 L'hemorragie massive simple devrait être suivie d'une operation Des hemorragies repetees rendent l'intervention indispensable

5 Les ulceres perfores peuvent être traités par simple suture, par une resection massive, ou ne pas être operes du tout

6 Au debut du siecle la gastroenterostomie simple etait l'intervention de choix Actuellement on pratique le Billroth I et II et la resection gastrique, suivis d'une operation du type Polya ou Hofmeister

7 La vagotomie avec gastro enterostomie posterieure est devenue courante L'auteur declare n'avoir jamais pratique de vagotomie

CONCLUSIONI

1 Esistono ancora divergenti opinioni sulla cura dell'ulcera

2 Troppo tempo ancora viene perduto con le cure mediche col rischio di giungere alla perforazione, all'emorragia, alla stenosi

3 Esistono opinioni diverse fra i chirurghi anche a proposito dell'epoca migliore per operare le ulcere sanguinanti

4 Un'emorragia unica massiva deve essere operata Le emorragie ripetute rendono l'intervento indispensabile

5 Le perforazioni devono essere o suturate o trattate con la resezione ampia o non operate affatto

6 All'inizio del 1900 la semplice gastroenterostomia era l'intervento di scelta Attualmente si ricorre alla resezione secondo Billroth I e II o ad altri tipi di resezione secondo Polya o Hofmeister

7 La vagotomia seguita da G E S posteriore è un intervento che ha incontrato molto successo, ma l'autore non ha mai fatto una vagotomia

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Surgical Treatment of Carcinoma of the Ampulla of Vater

LOUIS H. NASON, M.D., F.A.C.S.*

BOSTON, MASSACHUSETTS

CARCINOMA of the ampulla of Vater occurs not too rarely in elderly persons with a clinical picture of *painless but intermittent jaundice.* The possibility of a stone or of carcinoma of the pancreas is considered, but one does not think as often of a lesion at the ampulla. These are distinct pathologic entities with individual characteristics of their own. Their chronicity and the intermittence of symptoms seem characteristic. It is not at all uncommon to obtain a history of previous attacks of jaundice that cleared spontaneously.

In 1944 a 53-year-old patient presented herself to the clinic obviously suffering from obstructive jaundice. She had had three attacks of painless jaundice within the past three years, varying in duration from a few days to three weeks. Roentgen study revealed a polypoid lesion of the duodenum, and operation was advised. The patient refused and left the hospital. In 1949 she reappeared—again jaundiced. She had had "several" bouts of painless jaundice since her previous admission. The present attack was persistent, and she now agreed to operation. Roentgen examination revealed the previously noted polypoid lesion still present and larger than before. A Whipple type of operation was performed. The patient made a good convalescence and is alive and well today. Pathologic examination disclosed a large localized papillary carcinoma of the ampulla of Vater, with no evidence of spread.

*Associate in Surgery, Beth Israel Hospital, Boston; Instructor in Surgery, Harvard Medical School.

Submitted for publication Sept. 6, 1956.

This is a case in point. In addition, even during a given attack, the obstructive aspects vary and fluctuate in their severity, so that it is not uncommon to note a fluctuating serum bilirubin level. A patient may enter the hospital with a bilirubin value of 5 units, then have it run up to 8, then down to 5 and 3, and then up to 6 or 7 and then down again. Biopsy of the liver reveals a picture characteristic of obstructive cirrhosis. Repeated biopsies may show transient improvement. It is this fluctuation in the degree of obstructive jaundice that deserves emphasis. It is in sharp contrast to the situation observed with carcinoma of the head of the pancreas. With that unfortunate disease, once jaundice appears it is steadily progressive and there are no remissions.

The explanation for this variation lies in the pathologic characteristics of carcinoma of the ampulla and duodenum. These tumors are almost all of the papillary type —either papillomas or papillary carcinomas. They grow on stalks of various lengths and breadths and mechanically can produce intermittent plugging of the lumen of the ampulla. Furthermore, they are usually of a low degree of malignancy, which accounts for the fairly long histories and for the relatively high percentage of long-term operative cures. They are not extremely invasive; only in the late stages do they invade the pancreas or surrounding tissues through the duodenal wall, and lymph node metastases are late. Hence they lend themselves well to local operation. In the surgical series reported,

this type of lesion accounts for a high percentage of the good results obtained by either conservative methods or such radical procedures as the Whipple operation. I should like to present 4 cases in which I used a fairly conservative surgical approach with excellent results. There have been no deaths in this group, and the results to date are good. This is in sharp contrast to the situation after the Whipple procedure, which is much too massive for this type of lesion. It carries an operative mortality rate of 35 to 50 per cent, and, of the patients who have survived six months to a year, a high percentage of those proved to have carcinoma of the ampulla or the duodenum rather than carcinoma of the pancreas.

REPORT OF CASES

CASE 1.—M. P., a man aged 59, complained chiefly of painless jaundice. The laboratory data were consistent with obstructive jaundice. Roentgen study revealed a polypoid filling defect in the duodenum, in the region of the ampulla of Vater. At operation a papillary carcinoma of the ampulla was observed and resected. Convalescence was uneventful, and the jaundice cleared. Three years later the patient was reoperated on because of a new carcinoma, this time in the cecum. The duodenum was inspected and was normal except for some foreshortening in the length of the second portion.

CASE 2.—J. B., a man aged 62, had had three attacks of painless jaundice in the past six months, lasting from one week to two weeks each. Needle biopsy of the liver revealed a picture consistent with obstructive cirrhosis. The value for serum bilirubin was 5 units. Two days later it was 8.5, and four days later it was down to 6. Subsequent determinations revealed a minimum of 3 to another maximum of 7. Repeat biopsy revealed some improvement. Roentgen study suggested a filling defect in the duodenum at the ampulla of Vater. At operation a papillary carcinoma of the ampulla was discovered and resected. The patient has been followed for two and one-half years and is apparently well.

CASE 3.—J. S., a postman aged 66, had jaundice of ten days' duration, with no pain. He had been jaundiced three months earlier for about one week. The value for serum bilirubin was 4.5 units, increased to 7, receded to 5 and rose again to 7.5. Roentgen examination gave negative results. Operation was performed. A papillary carcinoma of the ampulla of Vater, 1 cm. in diameter, was observed and resected. There was no evidence of spread. Convalescence was uneventful, and the patient has remained well for the past twenty months.

CASE 4.—M. B., a man aged 69, complained of painless jaundice of one month's duration. A daughter thought that he had had several episodes of transient yellowish discoloration of the eyes over the past year. His son, a physician, had noted bile in his urine without visible jaundice, six months earlier. The serum bilirubin level was 9 units and fluctuated between 8 and 10. Roentgen study revealed a filling defect in the duodenum at the juncture of the second and third portions. At operation a papillary adenocarcinoma was observed and resected. The patient has remained well for the past eighteen months.

The procedure I have used begins with a transduodenal approach to the ampulla. The duodenum is opened transversely and the ampulla and its lesion are identified. The common duct is opened above the duodenum in the usual place, and a long Cattell tube is threaded down the duct through the ampulla. The duodenum is then mobilized so that the common duct can be traced along posteriorly and the head of the pancreas identified posteriorly. The posterior wall of the duodenum and the ampulla are resected transduodenally in a transverse elliptic fashion, the lower end of the common duct being removed and the pancreatic duct cut through. The duodenum (posteriorly) and the common duct are then anastomosed, and the pancreatic duct is sutured into the anastomosis with a small piece of rubber catheter tied into the duct and allowed to protrude into the duodenum. The T tube in the common duct is brought out through the new anastomosis and into the duodenum. The anterior opening (transverse) in the du m is then closed transversely.*

*For further decompression of the biliary tree a tube may be sewn into the gallbladder. This, of course, is not absolutely necessary The T tube may be kept in for three to six weeks

It is interesting that the common duct rarely traverses the substance of the pancreas; it simply lies alongside it, so that a pancreatic carcinoma occludes simply by compression of the common duct between it and the posteromedial aspect of the duodenum. This anatomic fact makes it technically easier to resect the lower end of the common duct and the pancreatic duct without entering the substance of the pancreas.

SUMMARY

A conservative surgical approach is recommended for extirpation of carcinoma of the ampulla of Vater. Four cases of carcinoma so treated are summarized. No deaths or complications occurred. They have been followed for from one and one-half to three and one-half years after operation. This more conservative procedure is suggested because it has not the high mortality rate of the Whipple operation and because the tumor is of low grade malignancy, remaining localized for long periods.

RÉSUMÉ

Une attitude plus conservatrice doit être adopté, plutôt que l'opération plus radicale de Whipple, pour le carcinome de l'ampoule de Vater. Cette lesion n'est pas très maligne, et n'a pas besoin d'un procedé massif radical.

RIASSUNTO

L'autore presenta 4 casi di carcinoma dell'ampólla di Vater. Questa lesióne non è molta maligna. Per conseguenza, egli raccomanda un accèsso conservativo in luogo dell'operazióne piu vasta anzi radicále di Whipple.

RESUMEN

El autor comunica 4 casos de carcinoma de la ampolla de Vater. Esta lesion no es extremamente maligna. Por esta razón, el autor recomenda uno acceso conservativo en lugar de operación radical de Whipple.

A large library is apt to distract rather than to instruct the learner: it is much better to be confined to a few authors than to wander at random over many.

—*Seneca*

Recurrent Hernias

ALFRED H. IASON, M.D.*

BROOKLYN, NEW YORK

WITH improved knowledge of the anatomic and architechtonic aspects of the inguinal area there has admittedly been a great decrease in the incidence of recurrent hernia. Today, however, despite this widening knowledge, it is not a problem that can be said to be finally solved.

There has been a wide divergence of view with regard to the main causes of recurrence after operation for hernia. They are as follows:

Preoperative Causes.—1. Incorrect identification of the specific hernia.

2. Contemplated operation illogically planned; for example, it is unnecessary to carry out a plastic repair in any person under 20 years of age.

3. Inapplicable selection of patients for a specific operation on account of one or more factors which should be deterrent; for example, asthma, myocarditis, hemophilia and other serious blood diseases.

4. Improper or inefficient preparation.

Surgical Causes.—1. The type of anesthesia utilized. If the patient is unrelaxed during the operation there is union of tissue under tension; with spinal anesthesia there is a greatly reduced tendency to vomiting, distention and muscular strain.

2. Incomplete asepsis.

3. Improper selection of surgical technic.

4. Improper selection of site for incision.

5. Use of improper suture material.

6. Incautious handling of tissues.

7. Incomplete removal of hernial sac.

8. Negligence in the detection and treatment of the direct component of a so-called pantaloon or "sliding hernia"—a condition of surpassing importance.

9. Inefficient narrowing of the abdominal inguinal ring.

10. Inefficient repair of defects in the inguinal triangle.

11. Nontransplantation or nonremoval of the spermatic cord with or without the testicle when indicated, e.g., in older age groups.

12. Inadvertent severance of the ilio-inguinal or ilio-hypogastric nerves.

13. Failure to use, or improper use of, transplant material where clearly indicated.

14. Improper use, placement or retention of drainage tubes.

15. Incomplete hemostasis.

16. Bilateral operations in inappropriate persons.

Postoperative Causes. — 1. Persistent coughing.

2. Lifting of heavy weights.

3. Straining at bowel movements.

4. Severe manual effort before a minimum of three months after the operation.

5. Prostatic obstruction.

Varieties of Recurrence.—These are: (a) indirect, shown in lower illustration, Fig. 1; (b) direct (most common) at upper left, Fig. 2; (c) saddlebag (pantaloon) in Figure 3; (d) bladder, in Fig. 4; (e) Spigelian (along semilunar line) Figure 5, and (f) sliding, in Figure

Anatom[illegible] found.—

*Attending Surgeon Adelphi Hospital, Consulting Surgeon, Brooklyn Home and Hospital for the Aged. Instructor in Anatomy, New York Medical College

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to reduce the rate of recurrence following operations for external abdominal hernias must be based on a thorough knowledge of the anatomic features, developmental and surgical, of the areas involved, the myodynamics and gross pathologic changes caused by the protrusion itself and the changes induced by surgical trauma. Without this knowledge surgical procedures are likely to be fallacious and productive of unsatisfactory results.

The apertures in the abdominal wall and within the cavity for the passage of structures entering or emergent are: anteriorly, the umbilical (in the fetus) for the transmission of the umbilical vessels, the allantois and vitelline duct; superiorly, the vena caval opening for the inferior vena cava and right phrenic nerve, the aortic hiatus for the aorta, vena azygos major and thoracic duct, and the esophageal hiatus for the esophagus, the vagus nerve, and the esophageal branches of the left gastric artery and vein; inferiorly, in the groin, there are two openings on each side—one for the femoral vessels and the lumboinguinal nerve and the other for the spermatic cord and its constituent blood vessels in the male and the ligamentum teres in women. Thus one is confronted with a complex set of anatomic relations, especially with almost contiguous blood vessels.

The fundamental anatomic weaknesses in perivascular spaces are predisposing factors in many cases of hernia, especially the inguinal and femoral varieties. In the umbilical area, the hiatus is caused by the presence *in utero* of an umbilical cord that encloses the yolk stalk, the allantois and the fetal blood vessels. Under normal conditions the vitello-intestinal duct, the omphalomesenteric vessels and the urachus atrophy into fibrous cords; thus, after birth, blood no longer circulates in the vessels of the cord, and a small crust forms where the cord has been ligated and cut. In time fibrous changes take place and draw the scar against the circumference of the ring. These formed adhesions are less dense at the superior margin thereof than at the inferior one. With the consequent weakness of the myofascial structures, the hiatus is insecurely closed and often becomes the site of hernia. Because emergent blood vessels are not present in this zone after birth, repair of these hiatus defects is usually satisfactory. Complete closure invariably eliminates any weakness. Recurrences here are therefore rare.

In the femoral area, between the inguinal ligament and the ileopectineal line, the space is divided into two compartments by a band of iliac fascia that extends from the ligaments to the ileopectineal eminence lateral to the femoral vessels. The medial compartment (lacuna vasorum) is occupied by the femoral vessels and the so-called femoral "canal." Directly mesial to this area is the oval femoral ring, which serves as a path between the abdominal cavity and the thigh. Despite such firm structures as the pectineus muscle and fascia and the tense lacunar and inguinal ligaments present in the area of the femoral canal, hernias occur there owing to weakness in the perivascular space adjacent to the femoral vessels. This weakened area along and circumjacent to the blood vessels is, in effect, mechanically vulnerable. Repair must be circumspect here in order to eliminate the anatomic defect without encroaching upon the blood vessels. High ligation of the sac by the low or the high operation often proves ineffective (see first two lower illustrations, Fig. 7).

The Inguinal Area. — In the inguinal area the physiologic-anatomic condition is still more disadvantageous. There is, furthermore, a wide divergence of views with regard to the architectonics and myodynamics of the area. Again, one must also study the mechanics of the deep ab-

dominal ring in an endeavor to ascertain whether the mechanism there is similar to a shutter or valve. The success or failure of a surgical technic in a specific operation depends on punctilious work. The approximation and union of various muscular, aponeurotic and fascial structures and their derivatives to close the defect are not always adequate. The reasons are anatomic, physiologic and pathologic.

These reasons cannot be separately adjudged. The inguinal area lies superior to the inguinal ligament. Medial and inferior to it is the zone of the femoral space (peritoneal protrusion). The importance of a clear understanding of the relations of these areas explains the occasional occurrence of a femoral hernia after an inguinal hernioplasty, as well as the concurrence of two varieties. Dugdale and Burton named that part of the inguinopectineal area above the inguinal one the "major superior inguinal triangle," and the one inferior to it the "major inferior triangle." Here femoral hernia occurs.

The anatomic arrangement is as follows: The descent of the testis, the spermatic cord with its constituent blood vessels and the vaginal process of peritoneum produces a defect of variable extent at the deep abdominal ring. The same effect in the female is produced by the round ligament, but to a lesser degree.

The deep or inferior epigastric vessels arise from the external iliac directly proximal to the inguinal ligament and ascend along the medial aspect of the abdominal inguinal ring close to the posterior wall of the inguinal canal in extraperitoneal tissue. They then pierce the transversalis fascia below the semicircular fold of Douglas. The deep circumflex iliac artery also arises from the external iliac on its lateral aspect. It is manifest, therefore, that the vascular system, with its perivascular spaces, clearly produces weak areas. The deep ring is really a defect in the transversalis fascia left by the descent of the testis with the tunica vaginalis. This weak, ovoid hiatus, with an attenuated medial arc, must be repaired to narrow the opening. The proximity of inferior epigastric vessels leaves a weak perivascular space (Fig. 8, upper illustration).

The Abdominal Rings.—Many years ago Arthur Keith wrote that the rings are not fixed spaces. The modern concept, as formulated by Lytle, is that they are mobile and under stress, and that they move upward and laterally under cover of the internal oblique and transversus abdominis muscles. Observed posteriorly these rings are, in effect, pivots around which the transversalis fascia is arranged. This U-shaped structure of fibrous strands, deficient superiorly, is placed obliquely and vertically open midway between the anterior superior spine of the ilium and the symphysis pubis. Its medial border is firm, and its lower angle lies subjacent to the margin of the transversus abdominis muscle to permit free egress of the spermatic cord. The fibrous strands circumscribing the ring are firmly anchored, as "slings," to the deep surface of the transversus abdominis muscle. The prominent margin of this opening extends backward at an angle below the spermatic cord. Under anesthesia, according to Lytle, the mobility of the ring may be readily demonstrated. The stretch reflex, or closure mechanism, is activated to protect the inguinal canal. There is consequently a mechanism similar to that of a sliding valve rather than that of a sphincter shutter. Undue pressure on the spermatic cord therefore does not take place. Another important element in this action is the fact that the medial pillar is larger than the lateral one. The latter part is anchored to a less mobile part of the muscle, which, closer to its point of insertion, moves only slightly (Fig. 9, upper and middle drawings).

The Musculature in the Inguinal Area.—Over the inguinal area the external oblique muscle becomes aponeurotic before its insertion into the rectus sheath (see upper illustration, Fig. 8). It forms the anterior wall of the inguinal canal and is condensed into the inguinal ligament, reaching the pubic bone in this form. Arching fibers bind the margins of the ring and form the outer layer of the cord sheath. The fibers prevent enlargement of the subcutaneous ring and maintain the tone of the aponeurotic strands. The inguinal canal is thus formed by the inferior reflection of the external oblique muscle.

The inferior fibers of the internal oblique and transversus abdominis muscles, which arise together from the lateral half of the inguinal ligament, are properly part of the inguinal area. The fusion of these muscles lateral to the rectus muscle forms a fairly broad, strong band, which is inserted partly into the anterior rectus sheath but mainly into the pubic crest. This tendinous extension, which forms a firm arch posterior to the medial part of the canal, is variously called the inguinal falx, the falx aponeurotica, the tendo conjunctus or the conjoined tendon. The fibers of both muscles, together with this tendon, curve inferiorly and medially and then cross the cord obliquely. One can visualize their position in relation to the spermatic cord, at first anterior, then superior and finally posterior (Fig. 8, upper illustration).

A cremaster muscle and fibers are almost ineffectual so far as myodynamic function is concerned.

The Ilioinguinal and Iliohypogastric Nerves.—Division of the ilioinguinal nerve before it enters the internal oblique may paralyze the muscle and thus become a predisposing cause in the development of a direct inguinal hernia. Numbness and pain may occur as a result of the injury. Owing to the fact that at this level the fibers are only sensory, motor disturbances are not likely to ensue. Injury to the nerve may also occur as a result of incisions in the lower part of the abdomen (Fig. 1, upper illustration).

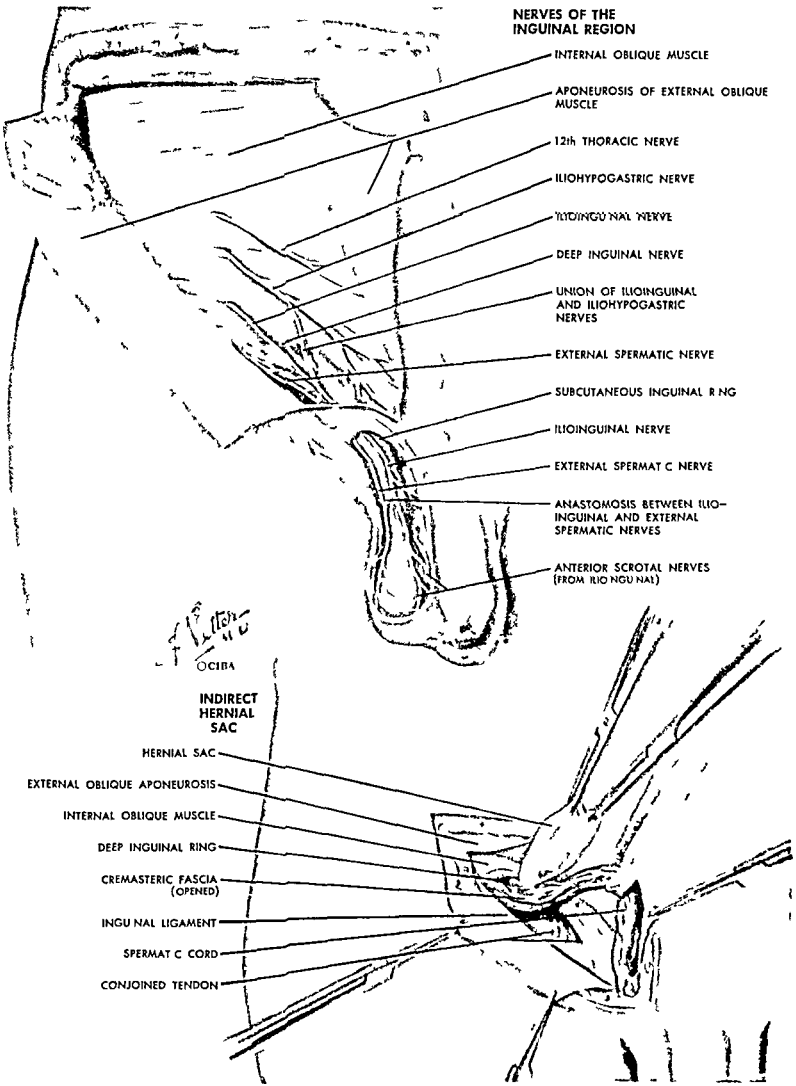
The iliohypogastric nerve supplies the skin of the gluteal area but not the penis. It also supplies the lower abdominal wall.

The ilioinguinal nerve comes from the first lumbar and supplies the skin of the pubis, the penis, the scrotum, the labia majora and the uppermost part of the medial aspect of the thigh.

The lumbar-inguinal division of the genitofemoral nerve, coming from the first and second lumbar, pierces the skin lateral to the femoral artery and about 1 inch (2.5 cm.) below the inguinal ligament. It supplies various areas of the skin distal to the intermediate part of the inguinal ligament.

The external spermatic division supplies the cremaster muscle and the skin over it.

The Transversalis Fascia and Ligaments.—According to Dr. J. C. Hayner, the brilliant anatomist, in the area of the lunette in Hesselbach's triangle the so-called transversalis fascia is fundamentally derived from true transversalis fascia, transversus muscle, intermediate fascia, internal oblique (cremasteric) muscle and superficial internal oblique (cremasteric) fascia, but maldevelopment, absorption and fusion may reduce stratification and muscular or fascial elements in a variable manner. The so-called transversalis fascia of the femoral sheath at times consists of two layers—derivatives of the internal oblique and transversus muscles. The internal oblique and transversus muscles decussate with each other in forming the cremasteric tunic of the cord at the abdominal inguinal ring, and the intermediate fascia becomes lost in that tunic. The abdominal ring should be regarded as a passage formed by trans-


NERVES OF THE INGUINAL REGION
INTERNAL OBLIQUE MUSCLE
APONEUROSIS OF EXTERNAL OBLIQUE MUSCLE
12th THORACIC NERVE
ILIOHYPOGASTRIC NERVE
ILIOINGUINAL NERVE
DEEP INGUINAL NERVE
UNION OF ILIOINGUINAL AND ILIOHYPOGASTRIC NERVES
EXTERNAL SPERMATIC NERVE
SUBCUTANEOUS INGUINAL RING
ILIOINGUINAL NERVE
EXTERNAL SPERMATIC NERVE
ANASTOMOSIS BETWEEN ILIOINGUINAL AND EXTERNAL SPERMATIC NERVES
ANTERIOR SCROTAL NERVES (FROM ILIOINGUINAL)
CIBA
INDIRECT HERNIAL SAC
HERNIAL SAC
EXTERNAL OBLIQUE APONEUROSIS
INTERNAL OBLIQUE MUSCLE
DEEP INGUINAL RING
CREMASTERIC FASCIA (OPENED)
INGUINAL LIGAMENT
SPERMATIC CORD
CONJOINED TENDON

versalis fascia, transversus muscle, intermediate fascia and a deep lamella of the internal oblique muscle. These muscular elements form the aponeurotic part of the inguinal falx, concealed by the more vertical fasciculi of the superficial lamella of the internal oblique muscle and its superficial fascia, and superimposed upon the transversalis fascia, which fuses with the aponeurosis at the linea semilunaris (Fig. 1, lower illustration).

The transversalis fascia is of rather firm texture in the gap below the lower margin of the internal oblique and transversus abdominal muscles. It is inserted and actually continuous with the iliac fascia near its fusion with the inguinal ligament. The ligament of Henle (a lateral expansion of the rectus tendon) acts as a medial reenforcement for this fascia. The interfoveolar ligament, which extends from the inferior margin of the transversus muscle to the superior pubic ramus, acts furthermore as a vertical reenforcement directly medial to the deep abdominal ring. In the inguinal area the fascia is denser and firmer than in other areas, partly because of the reenforcement but also because of the fact that fibers of the conjoined tendon are blended with it down to the inguinal ligament. In all probability the firmer texture of the transversalis fascia is mainly due to the extra strands of fibrous tissue from the tendo conjunctus. (In surgical procedures this structure may be utilized advantageously.) The deep crural arch is a thickening of this fascia.

The transversalis fascia is subjacent to and contiguous with the deep layer of the investing fascia of the transversus abdominis. From the surgical point of view this fascial layer should be considered the deepest fascial plane of the abdominal wall, which is intimately related to the internal fascial bed of the transversus abdominis muscle. Fibromuscular strands derived from the internal oblique and transversus abdominis muscles, either separately or conjointly, form the tendo conjunctus, become embedded in and consequently strengthen the transversalis fascia. Only careful dissection reveals this union. A weak inguinal triangle is largely attributable to a deficiency in these supporting fibers rather than to attenuation of the transversalis fascia *per se*.

The inguinal, lacunar (Gimbernat's) and suprapubic (Cooper's) ligaments play an important part in the repair of inguinal hernia, direct or indirect, and also in its recurrence.

The inguinal ligament (also termed the anterior iliopubic ligament) arises from the anterior superior spine of the ilium and extends downward and medially, tensely stretched to the pubic tubercule. It passes convexly toward, and concavely above, the thigh. From its broad insertion there is an extension (the lacunar, Gimbernat's or ligamentum inguinopectineal medialis) to the upper border of the superior pubic ramus and the pectineal line. Its base, which is concave, forms the medial boundary of the femoral ring; its apex corresponds to the pubic tubercle. From the base of Gimbernat's ligament a strong fibrous band (Cooper's ligament) extends along the pectineal line, to which it is attached directly above the origin of the pectineal fascia with which it fuses. It is also strengthened by a lateral expansion from the lower part of the linea alba (adminiculum lineae albae). This structure is now used by some surgeons in the repair of inguinal hernias.

Cooper's ligament also fuses with the pubic periosteum. It lies directly medial to the femoral vein. The pectineus muscle arises from the pectineal line of the pubis and a narrow margin of bone below. It forms part of the inguinal femoral space and is covered anteriorly by the infolding of the fascia lata that continues down beneath the falciform margin of the saphe-

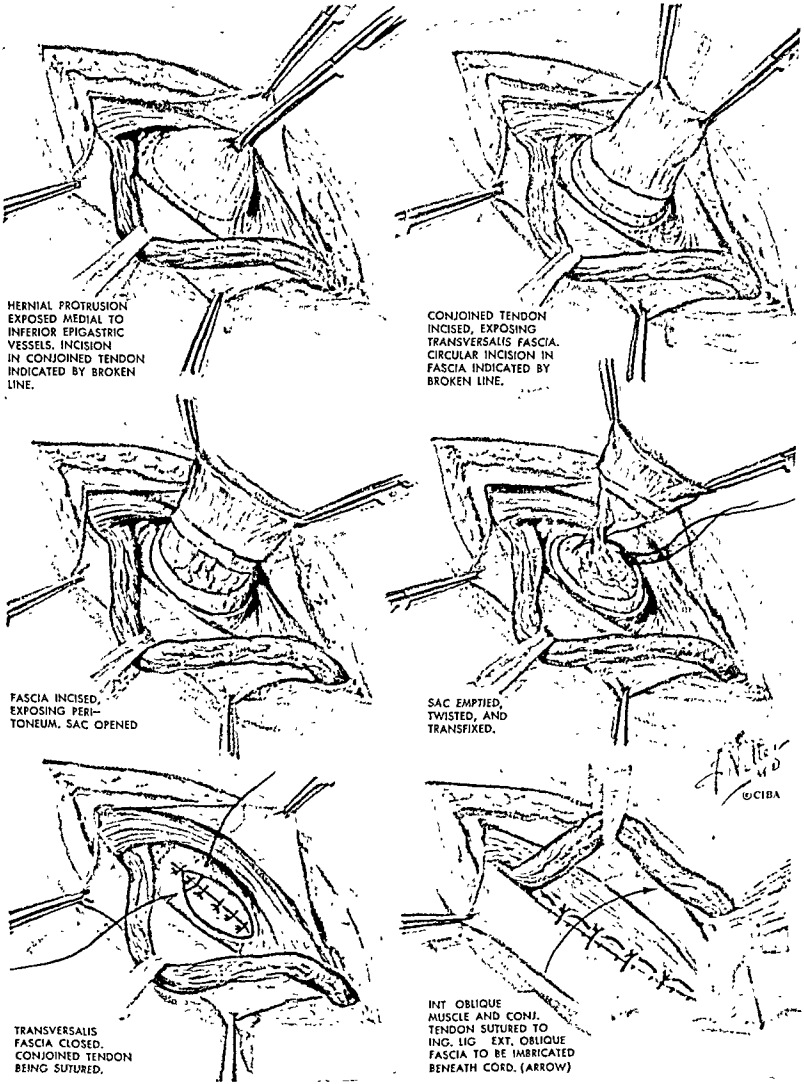

HERNIAL PROTRUSION EXPOSED MEDIAL TO INFERIOR EPIGASTRIC VESSELS. INCISION IN CONJOINED TENDON INDICATED BY BROKEN LINE.
CONJOINED TENDON INCISED, EXPOSING TRANSVERSALIS FASCIA. CIRCULAR INCISION IN FASCIA INDICATED BY BROKEN LINE.
FASCIA INCISED, EXPOSING PERITONEUM. SAC OPENED
SAC EMPTIED, TWISTED, AND TRANSFIXED.
©CIBA
TRANSVERSALIS FASCIA CLOSED. CONJOINED TENDON BEING SUTURED.
INT OBLIQUE MUSCLE AND CONJ. TENDON SUTURED TO ING. LIG EXT. OBLIQUE FASCIA TO BE IMBRICATED BENEATH CORD. (ARROW)

Fig. 2

Fig. 3.—Saddlebag hernia.

Fig. 4.—Large direct inguinal hernia. Bladder constituted entire hernia.

nous opening (Fig. 8, lower illustration).

Cooper's ligament is sometimes termed the iliopectineal ligament, because it overlies and is closely adherent to the iliopectineal line. It extends along the pecten of the superior pubic ramus to the pubic spine. Gimbernat's ligament should also be differentiated with regard to its origin, its insertion and its site, the iliopectineal medialis. In my opinion these names are better than the eponymic ones. The lacunar ligament is truly a curved extension of the insertion of the inguinal ligament placed medial to the annulus femoralis. The inguinal (Hesselbach's) triangle is not intrinsically weak but is the unguarded area of the abdominal wall because the internal oblique and transversus abdominis muscles do not cover it and perhaps fail to protect it.

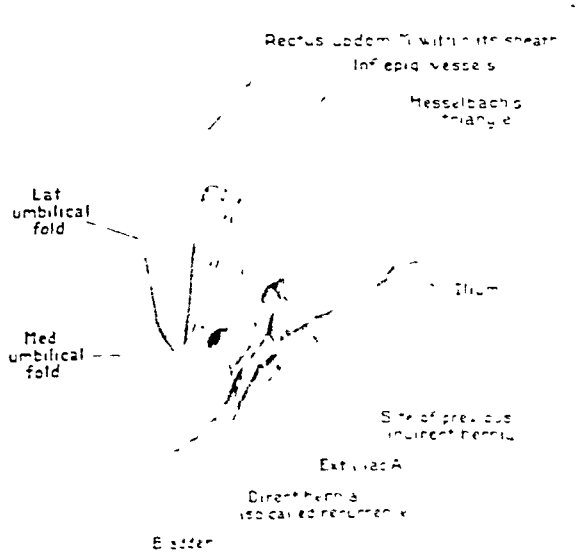


Fig. 5.—Spigelian hernia.

The Inguinal Canal.—The inguinal canal is a cleft in the anterior abdominal wall above the medial half of the inguinal ligament. In the male it contains the spermatic cord. It is about 1½ inches (3.7 cm.) long and extends from the deep ring to the subcutaneous inguinal ring. Its base is formed by the lateral part of the pubic crest, and its apex is directed upward and laterally. The anterior wall is formed by the aponeurosis of the external oblique muscle, and part of the internal oblique assists in its formation in the lateral third of the canal. The posterior wall is formed by the transversalis fascia. Its floor is formed by the upper half of the inguinal ligament and, at its medial end, by the lacunar ligament.

Union of Muscle and Fascia.—Selig and Chouke, after a thorough study of the moot question of the surgical union of muscle and fascia, came to the conclusion that "normal muscle will not unite firmly with fascia and ligament; it is

therefore useless to suture abdominal muscles to the inguinal ligament in the hope of buttressing a weak or ruptured abdominal wall." When it is approximated, however, to living fascial planes, firm union results. It has been proved that no structure derived from mesoderm can unite or heal without at first reverting to a state approaching the embryonal anlage.

Since the modern standardization of various technics in the surgical treatment of hernia, a constantly debated subject has been their advantages and disadvantages, particularly with regard to direct and indirect herniation. There has been little disagreement, however, concerning operations on patients in the younger age groups, who, as a rule, have good muscular and other supporting structures. High ligation of the sac and excision usually suffice for a permanent cure.

Take the Bassini operation, for example, or its numerous modifications. Some of the steps are clearly not only useless but harmful, in that the musculature is preternaturally stretched, which favors a recurrence. Then, too, suture of the conjoined tendon to the inguinal ligament is misconceived, owing to the fact that frequently there is no atony in the floor of the inguinal canal. Restriction of muscular movement usually results in disuse atrophy. Recurrence is thereby brought about by deranged myodynamics.

For indirect inguinal hernia in a muscular person in whom a deep ring is not greatly enlarged, a simple hernioplasty or herniorraphy, with repair of the transver-

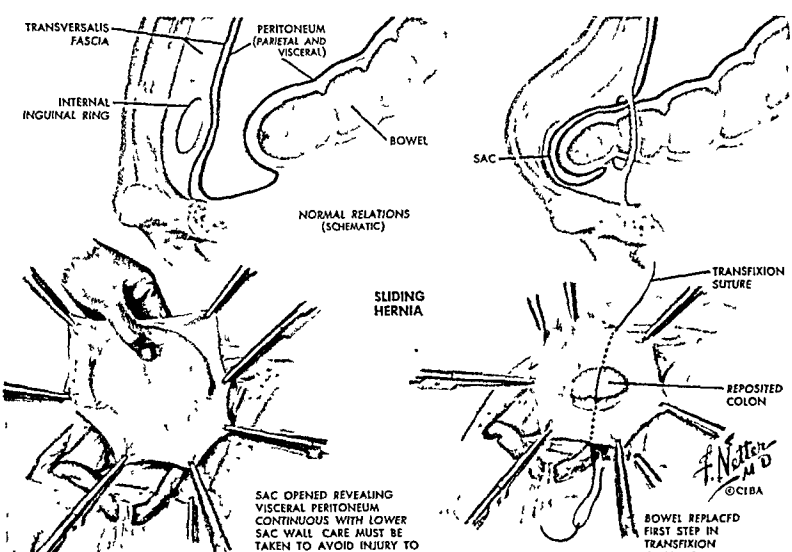


Fig. 6

salis fascia deep to the muscles at the ring, is adequate. For a large hernia, direct or indirect, primary or secondary, a modification of the Wyllys-Andrews operation (Fig. 11), a fascia lata transplant or the use of tantalum mesh gauze is usually curative. The accompanying table briefly summarizes the various types of inguinal hernias and the operations for each.

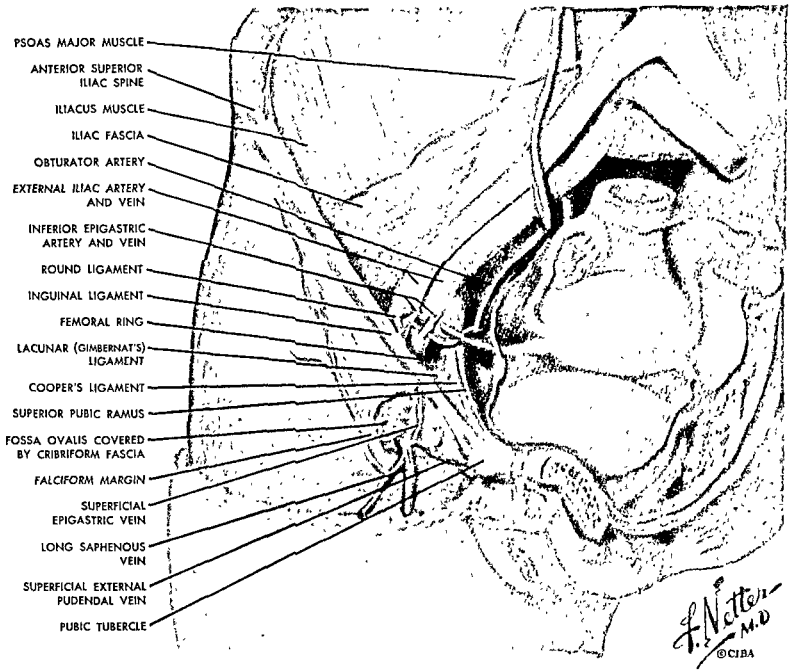
The Commonly Curative Technic.—An incision about 2½ to 3 inches (6.7 to 7.5 cm.) long is made, extending laterally from the pubic toward the anterior superior spine of the ilium. The incision is parallel to and ½ inch (1.2 cm.) above the inguinal ligament.

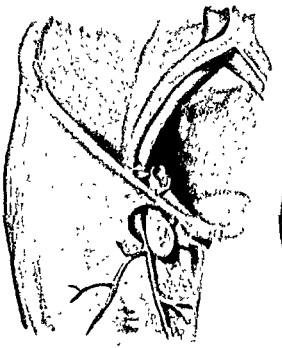
The superficial layer (Camper's) of the superficial fascia is then reached. Two Allis clamps are applied to the upper and lower skin margins. Gentle traction is made by means of the clamps so as to bring into view the three underlying vessels, namely, from medial to lateral aspects, the superficial external pudendal, the superficial epigastric and the superficial external iliac. With traction the tenuous fibers of Camper's fascia separate clearly, revealing these vessels. They are clamped. The supporting film of the deep layer of superficial fascia is then divided between the clamps, together with the vessels. Ligatures of fine catgut are then placed. The fibers of the external oblique aponeurosis come into view. The Allis clamps previously applied are held taut by an assistant. If necessary, a small retractor is inserted at the medial extremity of the wound, the subcutaneous or superficial inguinal ring being thereby exposed. Emerging through this opening, directly lateral to the pubis, the spermatic cord and the ilioinguinal nerve are seen. The cord appears to have an almost transparent film (the internal spermatic fascia) encompassing it, with some attenuated muscle fibers (the cremaster muscle). The external oblique aponeurosis is then divided from below medially, upward and laterally, care being exercised not to injure or sever the ilioinguinal and the iliohypogastric nerves. The latter nerve is craniad to the former and, unlike its counterpart, does not pass through the subcutaneous ring but pierces the external oblique aponeurosis slightly superior and lateral to the superior crus of the ring (Fig. 10, lower illustration).

Fine clamps are applied to the severed margins of the aponeurosis. Gentle traction is then made so as to bring the cord into view with its cremaster fibers. Weak filaments of transversalis fascia bind it to the posterior wall of the inguinal canal. The cord is now elevated digitally from its bed. The index finger is insinuated beneath it to separate the anchoring fibers, which are completely divided by finger dissection up to the deep inguinal ring.

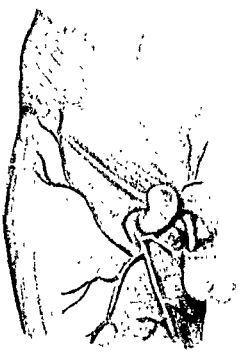
The inguinal triangle then comes into view. This zone, as previously stated, is formed by the transversalis fascia reenforced by extensions of the tendoconjunctus. At the lateral end, directly medial to the cord and the deep ring, these reenforcements are very strong (interfoveolar ligament of Hesselbach). With careful observation the pulsating inferior epigastric vessels can be seen, owing to their color and pulsations. They lie in the extraperitoneal tissues.

The cord is elevated by finger traction. It is inspected for abnormalities. The vas deferens must be identified. Occasionally, when one raises the cord from its bed, this structure may inadvertently be left in its original position. If this is the case it should be gently manipulated into its normal position. The character of the musculoaponeurotic structures is then studied. Care must be taken to separate the ilioinguinal and iliohypogastric nerves from their contiguity to the cord, so that they may not be injured in the subsequent steps of the operation.

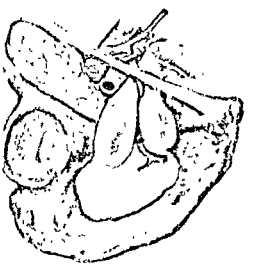




COURSE OF HERNIAL SAC THROUGH FEMORAL RING, FEMORAL CANAL, AND FOSSA OVALIS

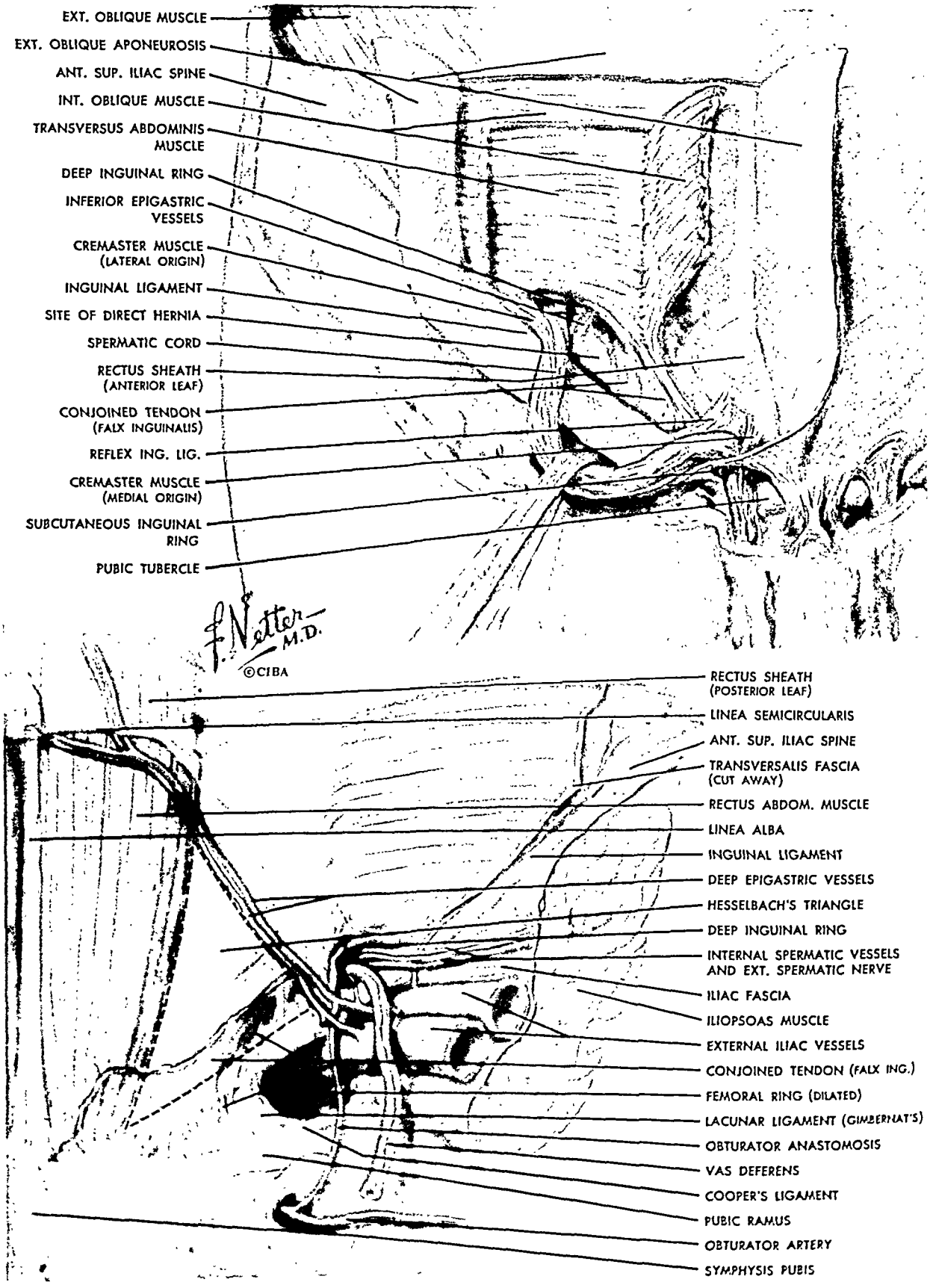


SAC TURNED UPWARD OVER INGUINAL LIGAMENT ALONG SUPERFICIAL EPIGASTRIC VEIN



BILOCULAR SAC DUE TO ABERRANT OBTURATOR

Fig. 7


EXT. OBLIQUE MUSCLE
EXT. OBLIQUE APONEUROSIS
ANT. SUP. ILIAC SPINE
INT. OBLIQUE MUSCLE
TRANSVERSUS ABDOMINIS MUSCLE
DEEP INGUINAL RING
INFERIOR EPIGASTRIC VESSELS
CREMASTER MUSCLE (LATERAL ORIGIN)
INGUINAL LIGAMENT
SITE OF DIRECT HERNIA
SPERMATIC CORD
RECTUS SHEATH (ANTERIOR LEAF)
CONJOINED TENDON (FALX INGUINALIS)
REFLEX ING. LIG.
CREMASTER MUSCLE (MEDIAL ORIGIN)
SUBCUTANEOUS INGUINAL RING
PUBIC TUBERCLE
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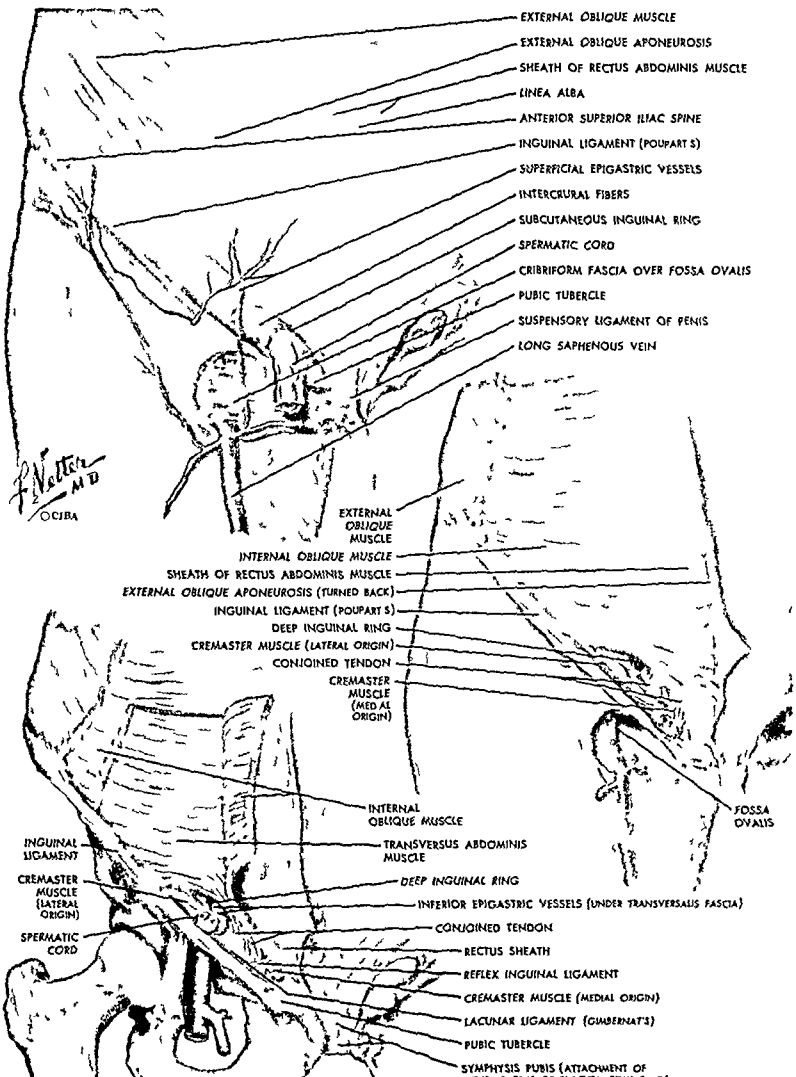
RECTUS SHEATH (POSTERIOR LEAF)
LINEA SEMICIRCULARIS
ANT. SUP. ILIAC SPINE
TRANSVERSALIS FASCIA (CUT AWAY)
RECTUS ABDOM. MUSCLE
LINEA ALBA
INGUINAL LIGAMENT
DEEP EPIGASTRIC VESSELS
HESSELBACH'S TRIANGLE
DEEP INGUINAL RING
INTERNAL SPERMATIC VESSELS AND EXT. SPERMATIC NERVE
ILIAC FASCIA
ILIOPSOAS MUSCLE
EXTERNAL ILIAC VESSELS
CONJOINED TENDON (FALX ING.)
FEMORAL RING (DILATED)
LACUNAR LIGAMENT (GIMBERNAT'S)
OBTURATOR ANASTOMOSIS
VAS DEFERENS
COOPER'S LIGAMENT
PUBIC RAMUS
OBTURATOR ARTERY
SYMPHYSIS PUBIS

Fig. 8


EXTERNAL OBLIQUE MUSCLE
EXTERNAL OBLIQUE APONEUROSIS
SHEATH OF RECTUS ABDOMINIS MUSCLE
LINEA ALBA
ANTERIOR SUPERIOR ILIAC SPINE
INGUINAL LIGAMENT (POUPART'S)
SUPERFICIAL EPIGASTRIC VESSELS
INTERCRURAL FIBERS
SUBCUTANEOUS INGUINAL RING
SPERMATIC CORD
CRIBRIFORM FASCIA OVER FOSSA OVALIS
PUBIC TUBERCLE
SUSPENSORY LIGAMENT OF PENIS
LONG SAPHENOUS VEIN
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CIBA
EXTERNAL OBLIQUE MUSCLE
INTERNAL OBLIQUE MUSCLE
SHEATH OF RECTUS ABDOMINIS MUSCLE
EXTERNAL OBLIQUE APONEUROSIS (TURNED BACK)
INGUINAL LIGAMENT (POUPART'S)
DEEP INGUINAL RING
CREMASTER MUSCLE (LATERAL ORIGIN)
CONJOINED TENDON
CREMASTER MUSCLE (MEDIAL ORIGIN)
INTERNAL OBLIQUE MUSCLE
FOSSA OVALIS
INGUINAL LIGAMENT
TRANSVERSUS ABDOMINIS MUSCLE
CREMASTER MUSCLE (LATERAL ORIGIN)
DEEP INGUINAL RING
INFERIOR EPIGASTRIC VESSELS (UNDER TRANSVERSALIS FASCIA)
SPERMATIC CORD
CONJOINED TENDON
RECTUS SHEATH
REFLEX INGUINAL LIGAMENT
CREMASTER MUSCLE (MEDIAL ORIGIN)
LACUNAR LIGAMENT (GIMBERNAT'S)
PUBIC TUBERCLE
SYMPHYSIS PUBIS (ATTACHMENT OF SUPERIOR CRUS OF SUBCUTANEOUS RING)

FIG. 9

The sac is then sought on the superomedial surface of the cord, its normal position. It is grasped with one or two fine clamps. Fairly firm traction is made upward and downward on the entire cord. The sac is completely separated from the cord down to the deep ring (Fig. 11). A Penrose or moist gauze drain is placed around the cord, so that by careful manipulation it is kept out of the surgical field. The sac is palpated to determine the presence of contents and then opened. The interior thereof is examined visually and then by finger exploration to ascertain the presence or absence of a sliding hernia or other content. An almost translucent, thin-walled sac, together with a fairly normal deep ring, indicates the probable presence of a hernia of recent origin. A thick-walled opaque sac with a dilated ring usually bespeaks a long-standing condition. With upward traction the sac is twisted upon itself, care being taken that any contents present have been replaced in the abdominal cavity. A transfixion strand of chromic No. 1 catgut on a round pointed, curved needle of medium size is then inserted to a point directly below the deep ring and tied firmly at the same time, while the sac is gradually untwisted to allow complete approximation of its walls (Fig. 11). A similar suture may be inserted but is usually unnecessary. The sac is then severed about ½ inch (1.2 cm.) distal to the suture line so as to remove the redundant distal part. The proximal stump is permitted to drop back into the deep ring. It is not transfixed to the musculature, lest a nerve be injured.

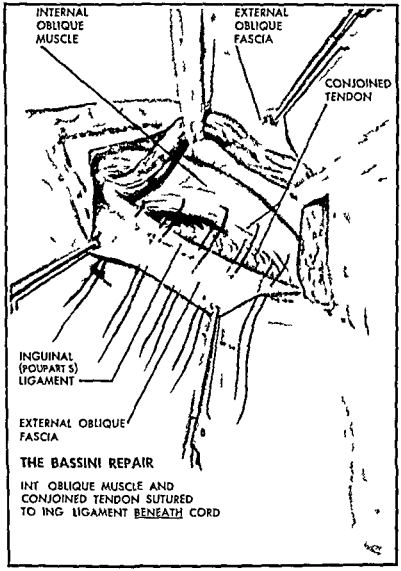
If there is a weak area in the inguinal triangle, the following procedure is carried out: Muscular elements of the internal oblique and transversus abdominis muscles, together with some subjacent tendo conjunctus fibers, are sewn to the shelving part of the inguinal ligament. This is accomplished with interrupted chromic sutures on a curved, round pointed needle. This shortens the superior and inferior widths of the triangle and reenforces it. The most lateral suture, directly medial to the cord, is placed in a circumspect manner to avoid injury to the inferior epigastric vessels. Enough room must be left for egress of the spermatic cord so as not to obstruct its blood circulation. The reenforcing fibers of the tendo conjunctus at times are very firm.

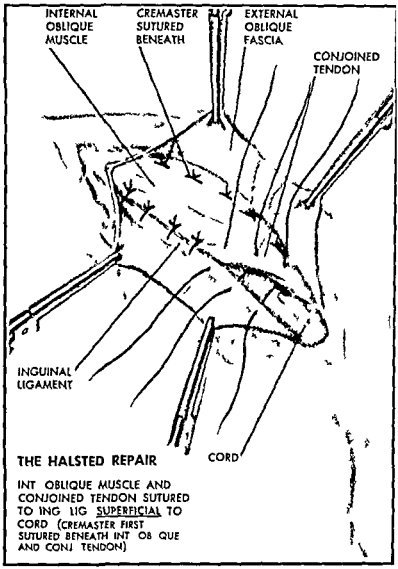
Of importance is the plication of the interfoveolar ligament. Throughout this step the cord is retracted upward. A retractor is inserted directly beneath the upper leaf of the external oblique muscle, while the clamp previously applied to the lower leaf is used as a retractor. Tying the sutures too firmly is avoided, in order to prevent pressure necrosis; in suturing musculature, however, some minor degree of muscle degeneration and replacement by fibrous tissue is unavoidable. This is necessary because muscle itself does not unite to approximated aponeurotic or fascial fibrous tissue unless it is first converted into fibrous tissue.

(The aforementioned technic need not be followed if there is no weakness in Hesselbach's triangle, especially in a young patient.)

The cord drops into its normal position on removal of the elevating gauze. The two leaves of the external oblique muscle are then approximated and united with interrupted sutures of No. 1 chromic catgut down to the pubic bone. Adequate space is left for the cord in the new subcutaneous ring.

If the inguinal structures are weak, additional steps are designed to fortify the triangle by overlapping the aponeurotic flaps. The upper free margin of the external oblique aponeurosis is sutured to the shelving part of the inguinal ligament with interrupted No. 1 chromic catgut sutures.


INTERNAL OBLIQUE MUSCLE
EXTERNAL OBLIQUE FASCIA
CONJOINED TENDON
INGUINAL (POUPART S) LIGAMENT
EXTERNAL OBLIQUE FASCIA
THE BASSINI REPAIR
INT OBLIQUE MUSCLE AND CONJOINED TENDON SUTURED TO ING LIGAMENT BENEATH CORD


INTERNAL OBLIQUE MUSCLE
CREMASTER SUTURED BENEATH
EXTERNAL OBLIQUE FASCIA
CONJOINED TENDON
INGUINAL LIGAMENT
CORD
THE HALSTED REPAIR
INT OBLIQUE MUSCLE AND CONJOINED TENDON SUTURED TO ING LIG SUPERFICIAL TO CORD (CREMASTER FIRST SUTURED BENEATH INT OB QUE AND CONJ TENDON)

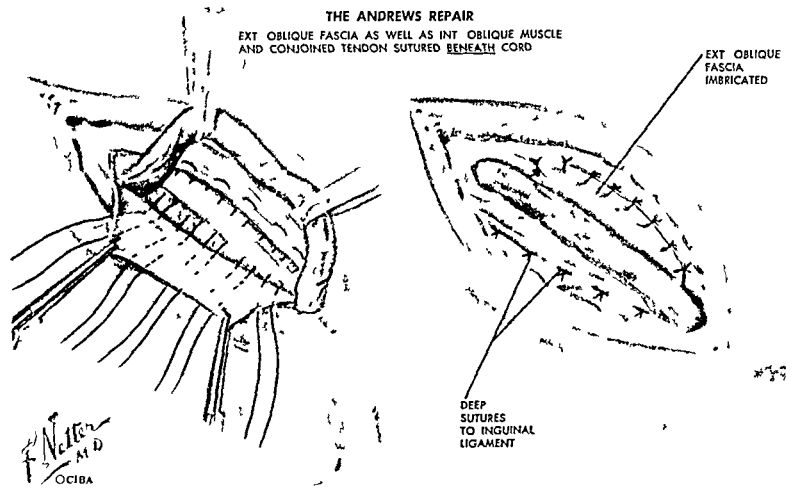

THE ANDREWS REPAIR
EXT OBLIQUE FASCIA AS WELL AS INT OBLIQUE MUSCLE AND CONJOINED TENDON SUTURED BENEATH CORD
EXT OBLIQUE FASCIA IMBRICATED
DEEP SUTURES TO INGUINAL LIGAMENT
F. Netter M D
CIBA

Fig. 10

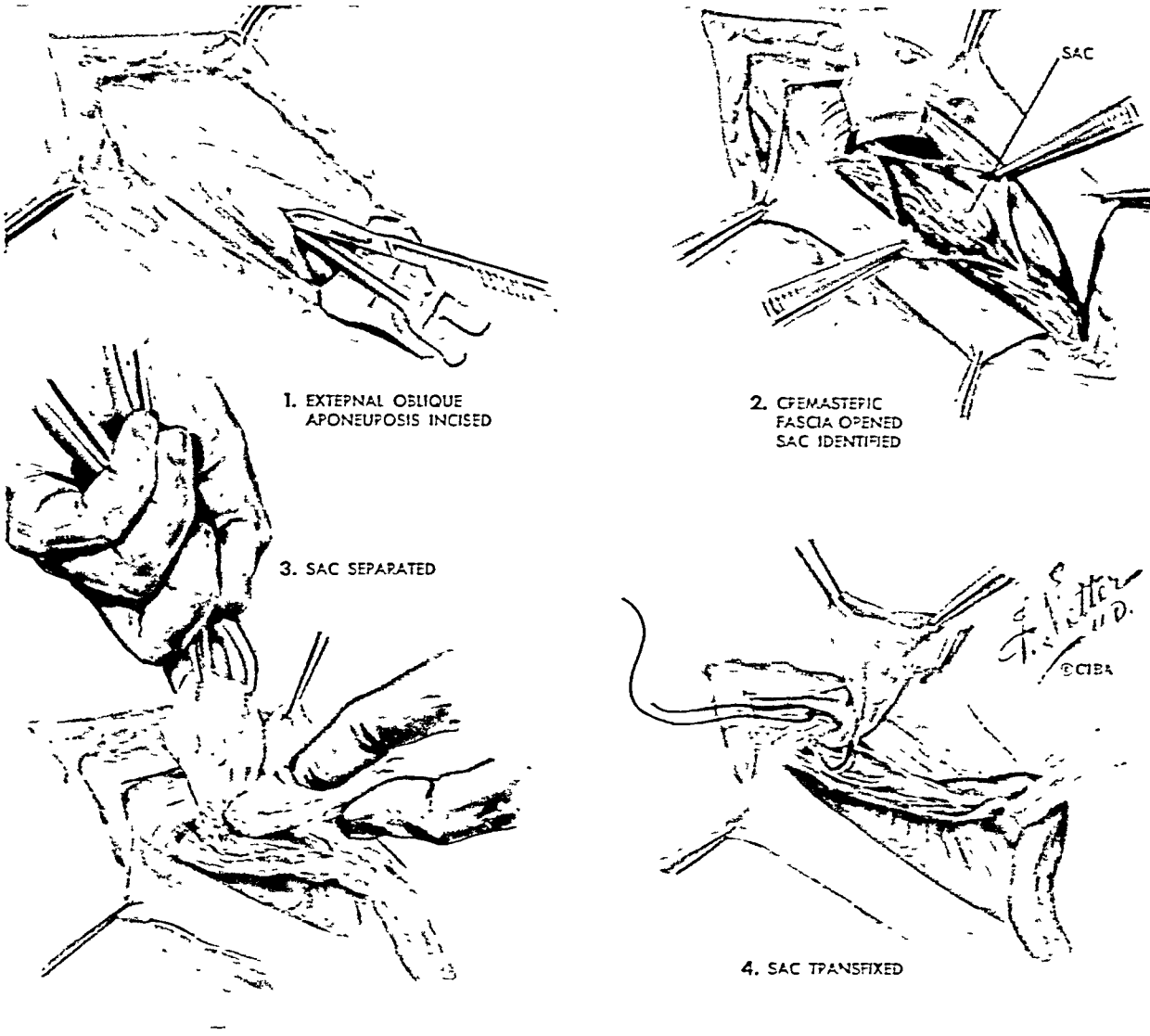


Fig. 11

Some surgeons maintain that suturing the abdominal musculature (external oblique aponeurosis) to the inguinal ligament results in an upward pull, thus partly displacing the inguinal ligament in that direction. This, it is maintained, predisposes to the formation of a new hernia beneath, be it inguinal or femoral. This conclusion is erroneous on anatomic and physiologic grounds. Furthermore, an accurate use of the method for reenforcing the inguinal triangle is all that is required. Then, again, it is technically difficult, and for an inexperienced surgeon hazardous, to utilize the iliopectineal (Cooper's) ligament as an anchorage for the external oblique aponeurosis. The fact that the femoral vessels are in close proximity, directly lateral and superior to it, render the insertion of a needle into the ligament dangerous. Only rarely may Cooper's ligament procedure be used.

It is advisable, however, to place one of the sutures through the lacunar ligament, approximating it to the lower extremity of what will become the superior crus of the new subcutaneous ring.

The final step in the hernioplasty con-

sists in approximation of the lower flap of the external oblique aponeurosis to the anterior surface of the upper leaf in a close, but not too tight, manner The most lateral suture must be placed directly medial to the cord to reenforce the structures surrounding the deep ring, but not, as has been stated, close enough to compress the cord (Fig 11) The cord then emerges through a cleft in the aponeurosis opposite the deep ring and passes subcutaneously toward the scrotum In some patients it is necessary to remove the cord and leave the testis The external oblique aponeurosis is closed over the deep ring, leaving no space (The testis does not atrophy)

The skin is then approximated and united in the usual manner It is unnecessary to suture the layers of the superficial fascia

Use of Tantalum Gauze — The transcendent value of tantalum gauze in the repair of massive and/or recurrent ventral hernias has been confirmed by a long line of great surgeons

The gauze, trimmed to approximate the area to be reenforced, is thoroughly cleansed with soap and water, rinsed wiped with alcohol and ether and finally autoclaved

In cases of recurrent inguinal hernia, for example, the gauze covers the hiatus in the transversalis fascia It is anchored to Cooper's ligament the anterior psoas fascia and the posterior aspect of the internal oblique muscle (The gauze can be placed between the peritoneum and the skin in the absence or deficiency of fascia) Or it may be sutured medially to the pubic periosteum, to the margin of the rectus sheath and laterally to the shelving edge of the inguinal ligament

The local conditions present suggest the technic to be followed The cut edges of the gauze are infolded about 0 5 to 1 cm to allow secure insertion of the sutures (braided tantalum wire) and to avoid possible fraying or exposure of the cut margins of the implant within the contiguous tissues The tantalum wire is placed without tension in contiguous strong fascia or aponeurosis (Moderately fine silk may be used to suture the gauze into position)

In the utilization of the gauze it is well to keep in mind the following points

1 In the repair of inguinal hernia the mesh may be utilized to reenforce Hesselbach's triangle, where large tissue areas are weak

2 The gauze can be deposited above or subjacent to fascia

3 A sufficient amount of subcutaneous tissue should remain under the skin flaps

4 The strands of monofilament, 10 mm tantalum are cut "on the square knot" The ends are crossed in V fashion, the apex of the V being directly above the knot Some surgeons urge the use of stainless steel wire In my own opinion, this is disadvantageous owing to the possibility of electrolytic corrosion and/or irritation

In my experience the use of tantalum gauze for various recurrent or massive hernias has been highly successful

SUMMARY

The causes of recurrent hernia may be classified as presurgical, surgical and postsurgical

A profound knowledge of anatomy and the implications of congenital and abnormal defects is essential to the surgical treatment of hernia It is most important to bear in mind the pathologic state preceding the operation and the pathologic changes caused by surgical maneuvers in the prevention of recurrence

There is no standard surgical procedure for each type of hernia The technic adopted depends upon the condition present At times, especially with recurrent hernias, the use of exogenous matter, such

Types of Inguinal Hernia and Operations for Repair

Varieties	*Sac*	*Transversalis Fascia*	*Secondary Protrusion*	*Repair*	*Closure*
1st degree	Indirect	Normal	None	Sac ligation	Normal
2d degree	Indirect	Weak	None	Sac ligation, plication of fascia	Modified Wyllys-Andrews
3d degree	Saddle-bag or pantaloon	Weak	Yes	Conversion into indirect sac or ligation of both sacs separately; plication of fascia	Modified Wyllys-Andrews with or without fascia lata transplant
4th degree	Saddle-bag or pantaloon	Weak	Bladder diverticulation	Ligation of indirect sac; bladder diverticulectomy; plication of fascia	Modified Wyllys-Andrews; bladder diverticulectomy with or without fascia lata transplant or tantalum mesh implant

Note: in patients beyond 60 years of age, the cord should be removed in addition, to permit complete obliteration of deep ring.

as tantalum, is extremely valuable

Finally, the classification on p 426 is presented as a guide in the surgical treatment of hernia

RÉSUME

Les causes de la hernie recidivante peuvent être pre-operatoires, operatoires et post-opératoires

Une connaissance approfondie de l'anatomie et des implications des lesions congenitales et pathologiques et essentielle pour le traitement chirurgical de la hernie Il est des plus important de tenir compte de l'etat pathologique pre opératoire et des modifications pathologiques causees par les techniques chirurgicales en vue d'eviter une recidive

Il n'existe pas de technique operatoire-type de la hernie La technique doit être adaptee à l'etat du patient Parfois, surtout en cas de hernie recidivante, l'emploi d'une substance exogene telle que le tantale, est des plus precieux

RESUMEN

Las causas de hernia recidivada pueden clasificarse en prequirurgicas, quirurgicas y postquirurgicas

Para el tratamiento quirurgico de la hernia es importante un conocimiento profundo de la anatomia, de los fundamentos embriológicos y de los defectos anatómicos Tambien es de gran importancia el tener presente el estado patológico previo a la operacion y los cambios patologicos producidos por las maniobras quirurgicas en la profilaxis de la recidiva

No existe un procedimiento quirurgico tipo para cada variedad de hernia La tecnica elegida depende del estado particular En ocasiones, particularmente en las hernias recidivadas, es de gran valor el uso de materias exogenas tales como el tantalo

ZUSAMMENFASSUNG

Die Ursachen fur ruckfallige Hernien lassen sich in prachirurgische, chirurgische und postchirurgische einteilen

Fur die chirurgische Behandlung der Hernien ist eine sorgfaltige Kenntnis der Anatomie und der Bedeutung angeborener und abnormaler anatomischer Defekte wesentlich Von grosster Wichtigkeit ist es, den pathologischen Zustand vor der Operation und die durch chirurgische Eingriffe zur Verhutung von Ruckfallen hervorgerufenen krankhaften Veranderungen nicht aus dem Auge zu verlieren

Es gibt kein chirurgisches Standardverfahren fur jede einzelne Form der Hernie Die anzuwendende Technik hangt von den gegebenen Krankheitsbedingungen ab In manchen Fallen, besonders bei ruckfalligen Hernien, ist die Verwendung korperfremder Stoffe wie z B Tantal von grossem Nutzen

RIASSUNTO

Le cause della recidiva dell'ernia possono essere classificate come prechirurgiche, chirurgiche e postchirurgiche

E' necessaria una profonda conoscenza della anatomia e delle cause congenite o anatomiche dell'ernia per una cura chirurgica soddisfacente E' importante anche conoscere le condizioni patologiche precedenti l'intervento e le modificazioni successive al fine di evitare la recidiva

Non esiste una terapia chirurgica standard per ogni tipo di ernia, latecnica da adottarsi dipende dalle condizioni del paziente In certi casi, e specialmente nelle ernie recidive, e di estremo aiuto l'impieg o di sostanze plastiche

SUMARIO

As causas de hernias recidivantes podem ser classificadas como pre cirurgicas, cirurgicas ou pos cirurgicas

Um conhecimento profundo da anatomia e das complicações de defeitos anatômicos congênitos e anormais é essencial para o tratamento cirúrgico da hérnia. É muito importante ter-se em mente e estado patológico que precede à operação e as alterações patológicas causadas por manobras cirúrgicas na prevenção da recidiva.

Não há um método cirúrgico padrão para cada tipo de hérnia. A técnica adotada depende da condição presente. Às vêzes, especialmente com hérnias recidivantes, o uso de matéria exógena, tal como o tântalo, é extrememente valioso.

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Angiographic Study of Infants and Children

ROBERT L. McLAURIN, M.D., D.A.B.

CINCINNATI, OHIO

ALTHOUGH angiographic study has become a standard diagnostic procedure, relatively few reports are available concerning its application to pediatric problems. The reasons for this are apparent when one considers the nature of neurosurgical diseases in infancy and childhood in contrast to that of the same conditions in adults. Aneurysms are practically nonexistent; tumors are usually subtentorial, and differentiation between degenerative vascular disease and surgical lesions is not necessary. Although these factors account for the relative infrequency of angiographic study in pediatrics, in selected cases it is an extremely valuable diagnostic tool. Although somewhat more difficult and time-consuming with children than with cooperative adults, it does not carry the same hazard of untoward reaction that exists with the latter group.

An account of the largest series so far reported appeared in a recent publication from the New York Neurological Institute. Poser and Taveras[1] stressed the fact that the procedure is accompanied by few complications; in their series of angiograms on 90 children there was only 1 instance of transient hemiparesis, and this was ipsilateral to the arterial injection. On the other hand, Tarlov and Rosenberg[2] reported 3 deaths from angiographic studies with diodrast in hydrocephalic children—the only complications they encountered in a series of angiograms on 13 children. The histologic picture in each of the fatal cases was described in detail—the only such descriptions of which I am aware—and included marked endothelial proliferation and pericapillary hemorrhages and edema associated with loss of normal cerebral architecture. Perese and his associates[3] also reported the death of a child, the only fatality in a series of 234 angiograms. Although their pathologic description did not state that hydrocephalus was present, the clinical description certainly suggests that it was. The child, 7 years old at the time of the angiographic procedure, had an arteriovenous malformation, and it is usually assumed that this type of lesion is protective, in that it is accompanied by a rapid circulation time and an excessive blood supply to the brain. I have had experience with a few patients with hydrocephaly secondary to obstructive tumors and have encountered no complications. Although experience is extremely limited, I do not consider hydrocephalus a contraindication to the procedure.

In this clinic angiographic studies have been performed on 35 children, some of them bilateral. In only 1 instance was there any significant reaction. This occurred in a 10-year-old girl suspected of having a vascular malformation. Sixteen

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hours after the angiographic procedure hemiparesis developed, but cleared during the next three days. The hemiparesis was definitely not present at twelve hours. Although the reaction is unusual, it must be directly attributed to the procedure.

The technic I have used for the angiographic study of infants and children varies from that for adults only in direct exposure of the carotid artery. In general, no attempt is made to take percutaneous angiograms in children below the age of six or seven years. General anesthesia is used routinely. When the open technic is employed, the common carotid artery is exposed through a transverse incision just above the clavicle. A polyethylene tube into which a No. 19 needle fits is inserted into the artery and threaded upward for a short distance, care being taken that it does not pass far enough to enter the external carotid artery. The use of a polyethylene tube has several advantages. It minimizes manipulation and irritation of the artery, which in turn reduces the hazard of vasospasm. There is no danger of puncturing the posterior wall of the artery, either when the head is being manipulated or during injections. Finally, the use of a suitable length of tubing allows the surgeon's hands to be adequately removed from the direct roentgen beam.

During the past one and one-half years I have used 35 per cent Urokon rather than diodrast and have had no permanent reaction in either adults or children. Although this drug is perhaps less toxic than diodrast, it is by no means innocuous, and the same precautions should be taken in its use.

Injections are made of 5 to 10 cc. of 35 per cent Urokon, depending upon the size of the patient. The total cerebral blood flow per unit of time is much smaller in infants than in adults; therefore, a smaller volume of dye is required to produce adequate contrast visualization. Because of the cumulative effect of contrast mediums, it is advisable to allow ten to fifteen minutes between injections.

Serial pictures are extremely useful in the management of certain lesions, as will be shown later. As a routine I take six pictures, at intervals of half a second, to show the various phases of vascular filling.

The value of angiographic study for patients in the pediatric age group lies not only in its use as a diagnostic tool for diagnosing lesions similar to those which occur in adult practice—vascular abnormalities, tumors, hematomas, abscesses, etc.—but as a possible means of obtaining further information with regard to certain congenital lesions. I have arbitrarily chosen reports of illustrative cases to demonstrate the general selection of patients and the typical angiographic patterns, as well as to bring out a few points in angiographic diagnosis. In particular, cases are viewed which show the role angiography has played in diagnosis.

CASE 1.—In this case the characteristic picture of a space-taking lesion was present. The patient was a 10-year-old white boy. He had been treated for meningococcic meningitis, which responded promptly to therapy. Subsequently papilledema developed; the boy had an attack of grand mal and a left temporal focus was revealed by the electrocardiogram. Neurologic examination gave negative results. The arteriogram showed elevation of the middle cerebral artery and typical displacement by a lesion of the temporal lobe. The absence of tumor stain, although not diagnostic, is characteristic of an abscess, which was present in this boy.

Angiographic examination is probably a less hazardous method of demonstrating abscesses of the temporal lobe than are air studies. Air studies present some danger, because the expanded temporal lobe can exert pressure on the adjacent brain stem more easily than can an abscess in any other part of the hemisphere. Moreover, the hazard of rupture of the abscess into the ventricle, with reduction of intraventricular pressure, is obviated. For these

reasons, angiographic study is the procedure of choice when a lesion of the temporal lobe is suspected, and particularly if abscess is a possibility. Moreover, it is particularly useful and definitive in distinguishing cerebral abscess from other infectious processes, such as subdural or epidural empyema, lateral sinus thrombosis or cerebellar abscess.

It should be pointed out that the degree of shift of the middle cerebral artery does not indicate the size of the abscess, because of the zone of edema surrounding the actual purulent process. Also, the degree of lateral shift of the anterior cerebral artery depends largely on the position of the abscess within the temporal lobe and does not indicate the volume of the lesion or the urgency with which it should be treated.

CASE 2.—A 4½-year-old white boy had a history of lethargy, headache, vomiting and drooping of the right eyelid for two weeks. On admission there was total paralysis of the third nerve, and intracranial hypertension was present. The diagnostic impression, because of the ocular signs, was aneurysm or a subfrontal tumor. Arteriographic study showed characteristic displacement of the middle cerebral complex.

This pattern is characteristic of a mass lesion in the left frontal lobe, but again there is no tumor stain. The tumors which are most likely to produce a characteristic appearance are meningiomas and glioblastomas, both of which are relatively rare in pediatric age groups. Ependymomas and astrocytomas, the commonest supratentorial lesions in childhood, do not produce recognizable vascular patterns, and angiography is therefore of little value in making a preoperative histologic diagnosis. The tumor in this case was ependymoma which occupied the entire frontal lobe.

I do not consider the role of angiographic study significant in the diagnosis or evaluation of mass lesions in the posterior fossa. My experience with vertebral injection has been limited, because of my reluctance to subject my patients to this somewhat more difficult procedure, which seems to have little value.

CASE 3.—A third type of space-consuming lesion is demonstrated in this case. An 11-month-old infant had been apparently well until he reached the age of 4 months, when he had an illness of several days' duration, characterized by vomiting and finally culminating in Jacksonian seizures, for which he was hospitalized elsewhere. After that episode his development was extremely retarded, and it was noted that he apparently could not see. When first examined he was markedly retarded and blind, and the circumference of his head was only 41 cm. The opinion at that time was that thrombosis of the sagittal sinus had occurred during the original illness. Since the family wanted the problem investigated, air and angiographic studies were undertaken. The air study revealed excessive filling of the subarachnoid spaces in both frontoparietal areas, which was taken to represent "cerebral atrophy." The sinogram was normal, but the arteriogram showed a typical subdural hematoma in both frontal regions. The depression of cortical vessels away from the calvarium with no vascularity of the area itself is, of course, pathognomonic.

This case is of further interest in that at surgery there was no falx in the region of the hematoma, which was one continuous sac extending to both sides of the midline. Whether this represented a congenital absence of the falx or whether it was destroyed in some manner by the hematoma is purely conjectural.

This case has considerable speculative interest. The history was perfectly consistent with the classic descriptions of sinus thrombosis. It is curious that only 1 case has been reported in the literature, to my knowledge, in which occlusion of a sagittal sinus in an infant has been demonstrated sinographically. This was reported by Scott[4] of Philadelphia. Clinically, the patient was thought to have amyotonia congenita. h ~~~re, Dr. Scott observed, in a inus thrombosis, bilater as

which, he postulated, were secondary to the thrombosis. Bailey and Hass,[2] in a pathologic study, also noted hemorrhage into the meninges and subdural space associated with sinus thrombosis. The question is raised of the frequency with which subdural hematomas in infancy, when no history of trauma is obtained, is the result of sagittal thrombosis. In this case the small head and the marked cortical atrophy would appear to be consistent with diffuse cerebral damage from venous thrombosis.

This leads to problems that rest more clearly on a congenital basis.

CASE 4.—A 15-year-old boy was well until he was struck in the forehead with a baseball, and for four days had had no symptoms; then there were persistent severe occipital headaches, diplopia and bouts of vomiting. Neurologic examination gave entirely normal results, but pressure on lumbar puncture was consistently over 200 mm. The clinical diagnosis was subdural hematoma of unknown location.

Arteriographic study showed no shift of the midline vessels and no evidence of subdural hematoma. The obvious abnormality here was the wide sweep of the anterior cerebral artery which characterizes hydrocephalus. In addition, the lateral venogram showed slight depression of the venous angle, the point where the striothalamic vein makes a sharp turn backward and is joined by the septal vein; this is also associated with hydrocephalus. A ventriculogram showed the extent of hydrocephalus present. Exploration of the posterior fossa revealed no abnormality beyond lack of patency of the aqueduct. A Torkildsen procedure was done, and at the time of writing the boy has been asymptomatic more than three months.

The mechanism of this disorder is not clear, but there must have been congenital hypoplasia or subependymal gliosis of the aqueduct, which then became incompetent after the trauma. This case is reported to demonstrate the role played by angiographic study in the diagnosis and also as an example of the significance of the venous phase.

Included under congenital lesions are the arteriovenous malformations. The classic obvious arteriovenous fistula, which may occur anywhere in the brain, is well known and does not warrant further discussion. These lesions, however, are apparently similar to aneurysms in their growth with time, and they are therefore not always easy to recognize angiographically. Two cases have been selected that show the value of serial angiographic study in this condition—not only to demonstrate the lesion that may be missed in single pictures during the arterial phase but to show the arterial and venous supply.

CASE 5.—An 11-year-old boy was admitted to the hospital after a sudden intracranial hemorrhage accompanied by right hemiparesis. Arteriographic study was done a few days later. Two phases were observed, which were at least one second apart. In the first of these a normal vascular pattern was present; in the second there was a vascular stain in the parietal area. This would probably have been missed completely if a one-exposure method had been used. The next angiogram of the same patient demonstrated the value of serial films in showing the arterial supply and later the venous drainage. In this particular lesion both of these were toward the midline. The series of films also demonstrated that the lesions may appear only as a vascular blush in early life, although they apparently become more recognizable as a cluster of vessels later.

Some of these lesions undoubtedly completely obliterate themselves at the time of rupture. Thus, although they are potentially lethal, even in early life, it may be difficult to demonstrate them angiographically or even at postmortem examination.

CASE 6.—A boy aged 16, whose lesion was more easily recognizable, was admitted to the hospital after a sudden hemorrhage accompanied by hemiplegia. The arteriographic series again demonstrated the value of serial pictures. Evidence of intracerebral hematoma was observed by the downward displacement of the middle cerebral complex. Again the

actual malformation was not clearly visualized, but the venous drainage from it was evident At operation a cluster of angiomatous microscopic vessels was observed at the point where the extensive intracerebral hematoma approached the surface of the cortex The angiomatous mass had probably been partly destroyed in the process of rupture

Arteriovenous malformations are responsible for nearly all the subarachnoid hemorrhages observed in children, which are fairly uncommon In addition to hemorrhage, they may be responsible for focal seizures The presence of repeated focal fits, especially if accompanied by a persistent electrocardiographic focus and normal results from air study, is a strong indication for angiographic investigation Despite the congenital nature of the lesion, it uncommonly makes itself known in early childhood—rarely before the age of 10 years

Allied to arteriovenous malformation are the various telangiectases of which the so called Sturge-Weber disease is one example This condition is in essence a telangiectasis of the pia arachnoid

CASE 7.—A 12 year old girl with a cutaneous hemangioma involving the first and second divisions of the trigeminal nerve was observed She was mentally retarded with right hemiparesis and jacksonian seizures The plane films of the skull showed not only the classic intracranial opacities but the signs of unilateral cerebral hypoplasia as evidenced by the asymmetry of the skull and the over development of the paranasal sinuses and mastoids on the involved side The angiogram was, characteristically not abnormal

This disease is presumably an angiomatous malformation of the neural crest, which contributes not only to the meninges but to the mesodermal mesenchyme of the face The opacifications observed are probably the result of degenerative changes in the cortex and are considered to exist on the basis of vascular stasis The layers with the greatest metabolic activity are affected, namely, the ganglionic layers of the cortex The term "calcification" has been avoided, as it has been shown by Lichtenstein and Rosenberg[6] that iron salts, rather than calcium, are actually present

CASE 8.—A 6 month old infant was suspected of having either toxoplasmosis or congenital cerebral vascular disease Six cc of diodrast was used and the angiogram showed simultaneous filling of all major vessels of the brain It was postulated by the radiologist that there may have been a temporary cardiac arrest to account for this filling It seems unlikely that sufficient pressure could be or was exerted to fill all the major vessels against arterial pressure This case is mentioned only as a curiosity, perhaps others have had this experience and understand its mechanism

COMMENT

No new concepts have been presented in this report It is simply a partial record of angiographic experiences at the Cincinnati General and Cincinnati Children's Hospitals I have attempted to emphasize my conviction that, although angiographic study has its limitations in pediatrics, it is a relatively safe and valuable procedure The incidence of complications is extremely low Also, I have selected cases in which the role of angiographic investigation can be seen in the evaluation of both developmental and acquired diseases Because of lack of space, sinus venographic study, which is also a valuable diagnostic procedure in certain cases, has not been discussed

SUMMARY

The diagnostic use of angiographic investigation as applied to pediatrics has not been reported with any great frequency, probably because of the wide differences that exist between the neurosurgical diseases of infants and children and adults On the other hand, it hazard for child[illegible] for

tients. In the author's opinion, in addition to its diagnostic value, angiographic study is a possible means of obtaining new and needed information with regard to certain congenital lesions.

RIASSUNTO

L'impiego dell'angiografia in pediatria non è molto frequente, forse per le grandi differenze che esistono fra le malattie neurochirurgiche dell'infanzia e quelle dell'adulto.

Vi è, d'altra parte, minor rischio nei bambini che nei soggetti anziani. L'autore ritiene che, oltre al suo valore diagnostico, l'angiografia possa portare nuovi contributi alla conoscenza di certe lesioni congenite.

SUMARIO

O uso diagnóstico da investigação angiográfica conforme é aplicada na pediatria não tem sido relatada com grande frequência, provàvelmente por causa das grandes diferenças que existem entre as moléstias neurocirúrgicas de crianças pequeninas e maiores e aquelas dos adultos. Por outro lado, leva menos riscos para as crianças do que par os pacientes mais velhos. Na opinião do autor, em acréscimo ao seu valor diagnóstico, o estudo angiográfico é um meio possível de se obter informações novas e necessárias em rolação a certas lesões congênitas.

RÉSUMÉ

Il n'est pas souvent fait mention de l'examen angiographique en pédiatrie, sans doute du fait des grandes différences existant entre les affections neurochirurgicales du nourrisson et de l'enfant, et de l'adulte. Cet examen présente d'autre part moins de risques chez l'enfant que chez l'adulte. L'auteur pense qu'en plus de sa valeur de diagnostic l'examen angiographique fournit des indications nouvelles et précieuses sur certaines lésions congénitales.

ZUSAMMENFASSUNG

Es liegen nicht allzu viele Berichte über die diagnostische Verwendung der Angiographie in der Kinderheilkunde vor. Der Grund dafür liegt wahrscheinlich in der Tatsache, dass sich die neurochirurgischen Erkrankungen von Säuglingen und Kindern erheblich von denen Erwachsener unterscheiden. Andererseits ist die Angiographie an Kindern weniger gefährlich als an älteren Kranken. Der Verfasser weist darauf hin, dass die angiographische Untersuchung ausser ihrem diagnostischen Wert auch die Möglichkeit in sich trägt, neue und notwendige Informationen über gewisse angeborene Erkrankungen zu geben.

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Radium Therapy of Malignant Tumors of the Bladder

New Technic and Results

RAYMOND DARGET, M.D., F.I.C.S. (Hon.)

BORDEAUX, FRANCE

HAVING previously reported my views on the treatment of malignant vesical tumors, I now present my results with surgical radium therapy in the treatment of these lesions. This paper will contain, as a matter of surgical interest, some new ideas on the subject, as well as the statistics thereon which I have prepared for presentation at the next meeting of the French Congress of Urology.

There are still urologists who, without experience in radium therapy, consider its efficiency limited to so-called favorable cases in which there is no extension of the lesion to the wall of the bladder. This is inaccurate, as I shall demonstrate its effectiveness by including data on serious malignant conditions treated with radium, often with remarkable results (Fig. 1). These tumors, without the help of radium, would have required total cystectomy.

Clinically and very simply, malignant tumors of the bladder can be classified into three varieties.

1. The type that exists in "favorable cases," without invasion of the submucosa.

2. A much more serious type, extensive and badly situated (around the ureteral orifices) and without mobility. Doubtless there is an early tendency toward infiltration of the vesical wall, and the histologic picture confirms this by showing the area to have been invaded to a greater or lesser extent.

3. A type that includes the most serious malignant lesions of all, those which have encroached upon one-third to one-half of the bladder, with repercussions upon the ureters and the renal cavities.

Having operated on more than 300 tumors of the bladder over the past twenty-five years, I should like to cite, for the sake of complete objectivity, 101 cases of such malignant tumors treated in the same clinic between 1942 and 1954 with the technic I have adopted and explained. Of the patients in these cases, 30 per cent had tumors of the highest degree of gravity (Category 3). Category 1 (20 cases) and Category 2 (50 cases) covered the remaining 70 per cent. The patients in the latter two categories were operated on with a genuine hope of recovery.

Considered statistically on the basis of the total, 101 cases, the series showed an operative mortality rate of 6 per cent.

At the time of writing, 83 per cent of the patients in Category 1 (the type with the most favorable prognosis) remain cured after five years and 84.5 per cent after three years.

In Category 2, wh[illegible] tients, 63.6 remain

Read at the T[illegible] Congress of the United St[illegible] onal College of Surge[illegible]

and 67.4 after three years.

In Category 3, which included 31 patients with tumors of the worst possible prognosis, 10.5 per cent remain cured after five years and 8.5 after three years.

Statistics on the whole series of 101 cases, including those in all three categories, indicate that 48.5 per cent remain cured after five years and 52.5 per cent after three years. When a patient has survived three years he has the optimal chance of permanent cure.

It is to be noted that, although for Categories 1 and 2 the results are, on the whole, satisfactory, those in Category 3 are unfortunately not equally good. Let us then study in detail the types of tumor that proved extremely serious and try to arrive at an operating tactic that may perhaps enable the surgeon to obtain less disappointing results.

Fig. 1.—*Above*, extensive tumor treated with radium four years prior to the time of writing. *Below*, extensive tumor recently treated with radium.

Among the tumors in this third and worst category, two types can be distinguished: (a) those obviously and unmistakably serious, with grave repercussions on the urinary tract, and (b) those whose exact degree of seriousness was not foreseen, so that upon operation they prove to be far graver than had been suspected.

With the first group it is possible to consider in advance the principal problems involved: first, what to do with the ureters, and second, what to do with the tumor? The ureters must be diverted either to the intestine or to the skin. Ureterointestinal anastomosis requires a patient who is not totally exhausted and whose kidneys are still functioning. The problem of renal function is in itself most difficult and uncertain, particularly when one is dealing with silent kidneys, which may prove to be completely destroyed or merely "dormant." One then runs the double risk of diverting to the skin a ureter that deserves a better fate and, on the contrary, the risk of anastomosing to the intestine the ureter of a kidney whose function is utterly destroyed. To avoid these dangers, it is best to take a pyelogram after direct puncture to the exposed ureters, using a special radiologic operating table; an immediate estimate of the area level from the urine collected by ureteral puncture prior to the pyelographic study must not be neglected. With the information so obtained, one can select the best methods of treatment in the particular case.

If it is decided to divert the ureter to the intestine, my personal preference is for a laterolateral anastomosis. This offers a high degree of safety, to whatever degree the ureter may be dilated.

With regard to the tumor itself, certain surgeons consider total cystectomy necessary. This I regard as an excessive sacrifice for an old or elderly patient, and not infrequently even a younger patient refuses it. My own opinion is that total cystectomy should be performed as rarely as possible.

The solution I propose, then, for the treatment of extremely grave vesical neoplasms is as follows:

1. Preserve renal function, which is sooner or later lost, by a *systematic* deviation of urine. At the very least, a valuable palliative procedure will have been done.

2. Destroy neoplasms in Category 1 by performing a wide cystostomy and completely leveling the tumor by means of a diathermic loop, after which radium needles should always be implanted into the base of the tumor. For want of this complementary treatment I have often observed grave recurrences, appearing with a rapidity that proved the inability of histologic study to predict the actual degree of malignancy of a given tumor.

3. Treat tumors in Category 2 with radium therapy, which they imperatively demand. (I do not refer here to isotopes, which I have used but rarely, my experience with radium itself having been satisfactory.) Without radium, a total cystectomy would be necessary for such tumors. What a price this is to pay for an eventual cure that might have been obtained with radium, with preservation at least of the sexual and vesical functions!

Thanks to a technic continually improved, I have been able to extend the field of action of radium therapy. Technically, my customary practice is as follows:

1. The radium needles must be accurately placed; a wide cystostomy, therefore, is necessary. Before they are inserted, the tumor has been leveled as deeply as possible with the diathermic loop.

2. The radium needles must be kept in place throughout the period of radium

Fig. 2.—Deperitonized bladder drawn out through operative wound.

therapy. This is best accomplished by reducing, as far as possible, the automatic physical contractions of the bladder, infiltrating the erigens and the pudendal nerves with procaine hydrochloride just before the operation is performed.

3. A special rubber balloon filled with a saturate solution of lead nitrate is placed close to the needles. This balloon prevents the needles from moving and acts as a screen against radiation.

4. The radium needles are left in place for three or four days, and a cystostomy is maintained for about four weeks in advance of closure of the bladder.

In the unceasing effort to continue improving the conditions of radium therapy, I recently hit upon a new technical detail that seems highly favorable: When the tumor is deeply placed and hard to expose, the bladder having a small capacity, "extraperitonization" of the bladder makes operating much easier (Fig. 2). Extraperitonization, which extends deeply below the base and the lateral facies of the bladder, permits intravesical and extravesical implantation of radium to be done simultaneously. I have no doubt that this would be of immense benefit to many patients with extremely severe vesical malignant disease, even some of those at the outer limits of effective re-

One can then envisage total destruction of the bladder by massive radium therapy.

Through a wide laparotomy I perform extraperitonization of the bladder and cleave deeply the posterior and lateral facets of the organ. In this way I am able to expose the ureter on each side at the level of the superior strait. If the conduits appear greatly enlarged and unhealthy, a bilateral cutaneous ureterostomy is performed and the ureters fixed side by side at the median line, which permits convenient collection of the urine. When, after all investigations, the condition of the kidneys and the ureters remain doubtful, a simple ureterostomy is performed on each ureter and a plastic ureteral sound of sufficient caliber is inserted and pushed up to the renal pelvis. This drainage is maintained as long as necessary, until one knows the exact condition of the kidneys and whether or not they are capable of improvement. The renal threat is thus avoided, and the surgeon is free to treat the neoplasm with total radium therapy, at the same time intravesical and extravesical. Some weeks later, being well informed as to the condition of the kidneys, he can select the type of deviation best adapted to the individual patient.

The simple ureterostomy will be replaced by either a cutaneous ureterostomy or a ureterointestinal anastomosis, according to what the renal condition seems to warrant.

These are my final conclusions as to the treatment of serious malignant tumors of the bladder, which confront modern surgeons with one of their most distressing problems.

SUMMARY

The author discusses the use of radium therapy for malignant tumors of the bladder. His experience does not confirm the theory that the efficiency of this form of treatment is necessarily limited to "favorable cases" in which the disease has not extended to the vesical walls. In his own practice he has extended its use with signal success. He describes his methods of using radium for vesical malignant tumors in three categories: (1) those that have not invaded the submucosa, (2) those which are much more serious and extensive and badly situated, e.g., around the ureteral orifice, and (3) the most serious of all, those encroaching on half of the vesical area, with disastrous effects on the ureters and the renal cavities.

Having operated on more than 300 vesical tumors in a period of twenty-five years, the author cites 101 which were treated by the method described, adding statistical data to demonstrate the high degree of favorable results.

RÉSUMÉ

L'auteur discute l'utilisation de la radiumthérapie dans le traitement des tumeurs malignes de la vessie. Son expérience ne confirme pas la théorie selon laquelle l'efficacité de cette méthode se limiterait nécessairement aux "cas favorables" où l'affection n'a pas atteint les parois vésicales. L'auteur a obtenu grâce à elle des résultats signalés. Il décrit ses méthodes de radiothérapie des tumeurs vésicales malignes qu'il divise en trois catégories: 1) celles qui n'ont pas envahi la sous-muqueuse, 2) celles, beaucoup plus graves et plus étendues et également mal situées, par exemple author des orifices urétraux, et 3) les plus sérieuses, celles qui empiètent sur la moitié de la surface vésicale, avec effets désastreux sur les uretères et les reins.

Ayant opéré plus de 300 tumeurs vésicales en 25 ans l'auteur cite 101 cas traités selon la méthode décrite; des données statistiques démontrent le pourcentage élevé de résultats favorables obtenus.

RIASSUNTO

L'autore descrive l'impiego della radiumterapia nella cura dei tumori maligni

della vescica La sua esperienza non conferma la teoria che questo metodo di cura deve essere limitato ai casi favorevoli in cui il tumore non e diffuso alle pareti della vescica Egli ne ha allargato l'impiego con successo e lo ha usato in tre categorie di tumori· 1) in quelli che non hanno invaso la sottomucosa, 2) in quelli piu gravi ed estesi e anche mal situati, come per esempio attorno agli orifici ureterali, 3) nei piu gravi di tutti, cioè quelli interessanti meta della parete vescicale con gravi ripercussioni sull'uretere e sulle cavita renali

L'autore ha operato 300 tumori della vescica in 25 anni e ne ha trattati 101 col metodo descritto ottenendo favorevoli risultati

ZUSAMMENFASSUNG

Der Verfasser erortert die Radiumbehandlung bosartiger Geschwulste der Harnblase Seine Erfahrungen konnen die Theorie, dass diese Behandlungsform nur in "gunstigen Fallen," wo die Erkrankung noch nicht auf die Blasenwand uebergegangen ist, wirksam sein kann, nicht bestatigen Er hat in seiner eigenen Praxis die Radiumbehandlung mit bemerkenswertem Erfolg ausgefuhrt und beschreibt seine Methode der Anwendung bei bosartigen Blasengeschwulsten der folgenden drei Kategorien. 1 Geschwulste, die nicht in die Submukosa eingedrungen sind, 2 schwerere, ausgedehntere und ungunstig gelegene Geschwulste, z B in der Umgebung der Harnleitermundungen, und 3 die allerschwersten Formen, wo die Geschwulst die Halfte der Blase umfasst, mit verheerendem Einfluss auf die Harnleiter und die Nierenbecken

Der Verfasser hat in 25 Jahren uber 300 Blasengeschwulste operiert und fuhrt 101 Falle an, die mit der von ihm beschriebenen Methode behandelt wurden Die grosse Anzahl gunstiger Ergebnisse wird an Hand von statistischen Angaben nachgewiesen

SUMARIO

O autor discute o uso de radiumterapia para tumores malignos da bexiga Sua experiência não confirma a teoria de que a eficiência desta forma de tratamento e necessecariamente limitada aos "casos favoraveis" nos quais a molestia não tenha se estendido as paredes vesicais Um sua propria clinica estendeu seu uso com sucesso marcante Descreve seus metodos no uso de radium para tumores malignos vesicais em tres categorias (1) os que não invadiram a submucosa, (2) aqueles muito mais graves e extensos e tambem mal situados, por exemplo, em redor dos orificios ureterais, e (3) osmais graves de todos, os que tomam metade da area vesical, com efeitos disastrosos nos ureteres e cavidades renais

Tendo operado mais de 300 tumores vesicais em um periodo de 25 anos, o autor cita 101 que foram tratados pelo metodo descrito, acrescentando dados estatisticos para demonstrar o alto grau de resultados favoraveis

Many men do not allow their principles to take root, but pull them up every now and then, as children do the flowers they have planted, to see if they are growing

—*Longfellow*

The Concept of Grading Gliomas of the Central Nervous System

GEORGE P. SAYRE, M.D., D.A.B.

ROCHESTER, MINNESOTA

THE classification of gliomas on the basis of cells of origin, and the division of the tumors thus formed by grades of malignancy, have been an outgrowth of the current understanding of the causation of tumors. Since there are only three types of adult glial cells, it would seem natural that there should be only three types of glioma, with varying degrees of malignancy depending on the histologic picture. A fourth type of tumor, the medulloblastoma, probably of embryonic cellular origin, must also be included because of its frequency. It was with this thought in mind that Kernohan and his associates[1] in 1949 published their paper on the grading of cerebral gliomas.

Since the dawn of history man has been fascinated by the growth of tumors. Their development was originally ascribed to malignant spiritual influences. Later, with the development of the Greek school of humoral pathology, neoplasms were considered to develop from excess of bodily secretions. The gradual shift to the current hypotheses has depended on the development of new instruments of precision and new experimental methods, and on man's genius in correlating the observations so obtained. Thus it was that, with the development of the microscope, Schwann,[2] in 1838, was able to develop the theory of the cell as the basis of living organisms, and Müller first demonstrated that tumors consist of cells, though it was his theory that the cells arose from an undifferentiated ground substance or blastema. Virchow, in 1858, stated his well-remembered dictum that tumors develop only from pre-existing cells, but fell into the error of believing that all malignant lesions develop from connective tissue; and it remained for his pupils to demonstrate that tumors could develop from other cells.

In the great age of morphologic pathology thus introduced, great strides were made in the description and classification of tumors of the human body. This work was aided in the latter half of the nineteenth century by the development of the aniline dyes used in staining histologic sections and by the perfection of the compound microscope, which together permitted the minute histologic description of innumerable tumors. The first major classification thus was a division into tumors of organoid growth, the carcinomas, and tumors of histoid growth, the sarcomas.

At the same time, speculation continued with regard to the etiologic factors in tumor formation. Even in the earliest years of the nineteenth century several hypothe-

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From the Section of Pathologic Anatomy, Mayo Clinic and Mayo Foundation, Rochester. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

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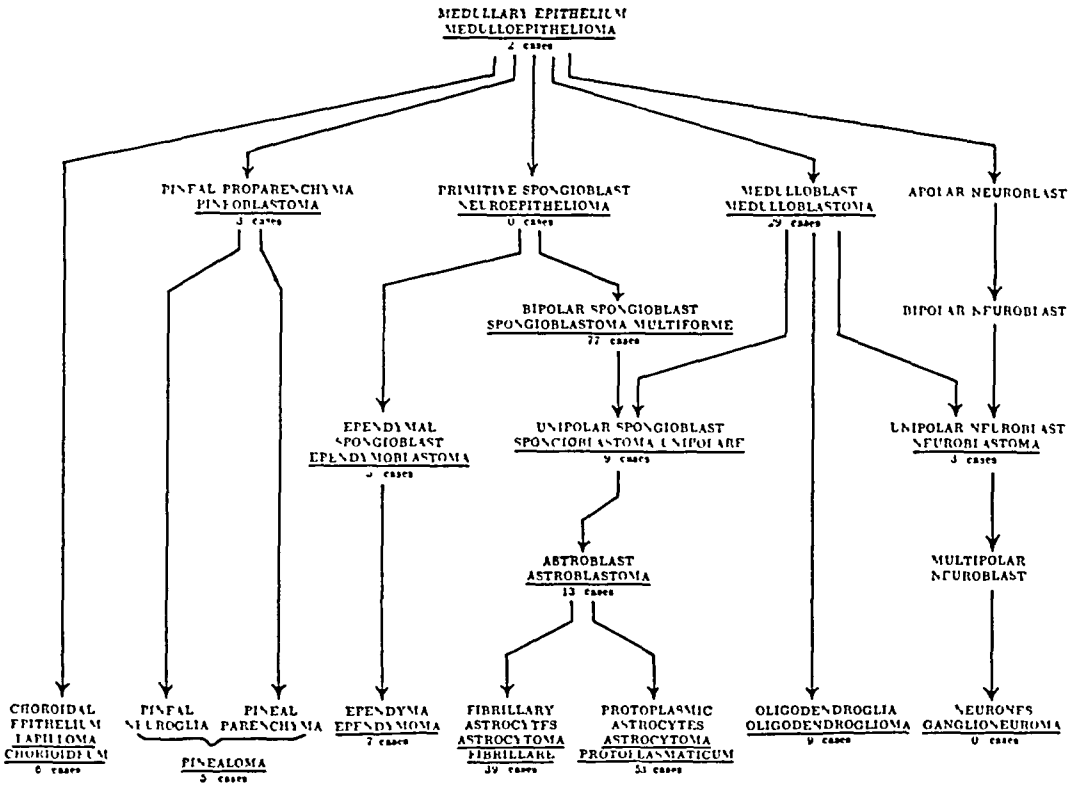
ses, many still in current usage, had been postulated. These included hypotheses that cancer resulted from a virus, developed from a primitive fluid blastema or lymph, or from misplaced embryonic cells, or was caused by specific trauma. In 1877 Cohnheim[3] formulated his hypothesis of the origin of tumors from misplaced embryonic cells or cell rests, basing it on the similarity of the morphologic picture of tumor cells to that of cells of the developing embryo (which were being described in detail at this time) and the occasional observation of misplaced embryonic cells in routine studies of histologic sections. Most of the classifications offered in the first half of the present century were based on this hypothesis.

In the early study of tumors of the central nervous system pathologists were hampered by difficulty in the staining of the cells, and, consequently, in understanding the relation of the cells. The rapidity of degeneration of the central nervous system after death and the general histologic complexity of the brain added to the problems, so that the general pathologists shied away from these studies and were content to classify tumors of the brain as gliosarcomas. The studies were continued only under great handicaps by those especially interested, the neurologists and psychiatrists, many of whom worked outside the general stream of pathologic philosophy. The usual stains available were not adequate to differentiate the cells, and the Golgi stains, the first to reveal the finer structure of the glial cells, were laborious, time-consuming and inexact. It was not until the early part of the present century, after publication of the work of Cajal, who used a modified Golgi technic, and his famous pupil, Del Rio Hortega, who used silver stains, that the morphologic riddle of the cells of the brain was solved.

Soon after this, a further stimulus for the detailed classification of brain tumors came with the development of neurosurgical technics. The necessity of classifying tumors detected by surgeons, so as to be able to give some practical advice as to the method of attack and as to the prognosis, soon became apparent. Thus it was that two neurosurgeons, Percival Bailey and Harvey Cushing,[4] published in 1926 their monograph, "A Classification of the Tumors of the Glioma Group on a Histogenetic Basis with a Correlated Study of Prognosis," the first logical classification of glial tumors of the central nervous system. Two themes run through this book: first, the relation of the histologic configuration of the tumors to the cells in the embryologic development of the brain; second and collaterally, the influence of the Cohnheim hypothesis of the origin of tumor from misplaced cell rests. Having reviewed the histogenesis of the central nervous system, they were able to chart the development of the cells and superimpose on this chart the tumors that most closely resembled the embryonic cell types. That Cohnheim's hypothesis could not explain the development of all gliomas they were well aware. This applied primarily to tumors of adult-appearing cells, with which the hypothesis of Samuel was evoked: that cells of least specialized functional differentiation most easily assume neoplastic traits. The problem of the origin of the spongioblastoma multiforme was further discussed because the investigators had noted, as had others before them, that multiple biopsies seemed to indicate increasing alterations of the tumors from protoplasmic astrocytomas to spongioblastomas. Here they mentioned that a dedifferentiation seems to have occurred with a corresponding increase in the rapidity of growth.

At the time of the publication of this monograph, two other lines of cancer investigation were being pressed. Pott,[5] in 1775, had noticed the prevalence of cancer of the scrotum among chimney sweeps. It

TABLE 1.—*Bailey and Cushing's Classification of Types of Glioma**



*Reproduced with permission from Bailey, Percival, and Cushing, Harvey: A Classification of the Tumors of the Glioma Group on a Histogenetic Basis with a Correlated Study of Prognosis. Philadelphia: The J. B. Lippincott Company, 1926.

was not till the beginning of the twentieth century that further studies of artificial tumor production were undertaken on a large scale, based on the ability of tar and its fractions to act as carcinogenic agents; the first large contributions began to appear in 1925, under the direction of Kennaway.[6] Later it was determined that, by the use of suitable agents, tumors could be produced in nearly all tissues, though with varying degrees of frequency. As the result of these studies it has been generally accepted that tumors develop from preexisting adult normal cells through some change, as yet unknown, produced by the carcinogenic agent. Whether this change occurs in a single cell, as described by Sutton, or develops in a whole area or field, as postulated by Willis,[7] has not been settled, and both mechanisms may operate.

Early work on chemical carcinogenesis was limited at first to the skin and only later expanded to include the internal organs. In 1939, Seligman, Shear and Alexander[8] were able to produce brain tumors by this method. Using similar technics, Zimmerman and Arnold,[9] in 1941, developed tumors classified by them as astrocytoma, glioblastoma multiforme, medulloblastoma, oligodendroglioma and spongioblastoma, as well as several unclassified gliomas. The histologic type of tumor appeared to depend on the location of the carcinogenic pellet in the brain and the corresponding type of cell stimulated. As the result of these studies, the hypothesis of Cohnheim that brain tumors develop from immature cell rests no longer plays a dominant part in the theory of their origin; rather, the theory that these tumors

likewise develop from pre-existing adult cells as the result of some stimulus is now coming to the fore. That certain tumors, usually observed in infants and children, do develop from cells as yet undifferentiated, but by the same process, has not been denied.

The other concurrent development occurred as the result of the surgeon's desire to have some idea as to the degree of malignancy of any one particular tumor. Broders,[10] in 1920, reporting on a study of 535 cases of carcinoma of the lip, divided the carcinomas, on histologic grounds alone, into four groups or grades, based on the degree of anaplasia of the cells in the tumor. He followed Hausemann's suggestion, formulated in the 1870's, that tumors develop by anaplasia or dedifferentiation of mature cells, and he classified the tumors according to the percentage of cells that were mature or differentiated. If between 75 and 100 per cent of the cells were differentiated, the tumor was Grade 1; between 50 and 75 per cent, Grade 2, and so forth, using the generic name of the mature tissue for the suffix to the grade. In 1926[11] he was more precise in defining undifferentiated cells, classifying cells that were in mitosis or had prominent nucleoli as undifferentiated cells, and, using the same percentile figures, divided the tumors thus studied into grades.

After making his histologic classification, Broders studied the postoperative results and noted that, in general, patients with tumors of Grade 1 malignancy had fewer metastases and lived longer than did patients with tumors of Grade 2 malignancy. Similarly, the figures for Grade 2 were better than for Grade 3, and those for Grade 3 were better than those for Grade 4. Not only did this system apply to cancers of epithelial origin, as originally described, but, through use of the same method of grading, similar prognostic evaluation was successful for the other groups of tumors studied, so that the method has a universal statistical application.

Unfortunately, many misunderstandings have developed concerning Broders' classification. The classification is based on the histologic appearance of the cells, no matter what their origin, so that there is

TABLE 2.—*Kernohan's Classification of Gliomas, Modified**

New	*Old Term, with New in Parentheses*
Astrocytoma, Grades 1 to 4	Astroc [illegible] Grade 1) Astrob [illegible] ide 2) Polar [illegible] Globla [illegible] ytoma, Grades 3 and 4)
Ependymoma, Grades 1 to 4	[illegible] Grade 1) [illegible] des 2 to 4) [illegible] de 4)
Oligodendroglioma, Grades 1 to 4	[illegible] Grade 1) [illegible] toma, Grades 2 to 4)
Medulloblastoma	Medulloblastoma
Neuroastrocytoma, Grades 1 to 4	Ganglioneuroma, Gangliocytoma, Ganglioglioma } (neuroastrocytoma, Grade 1)
	Spongioneuroblastoma, Glioneuroblastoma and others } (neuroastrocytoma, Grades 2 to 4)

*Reprinted with permission from Adson and Svien, Rocky Mountain M. J. 45:962-968 (Nov.) 1948.

TABLE 3.—*Classification of Gliomas*

Ependyma	Astrocyte	Oligodendroglia	Neuron
Ependymoma	Astrocytoma	Oligodendroglioma	Ganglioneuroma
Grade 1	Grade 1	Grade 1	Grade 1
Grade 2	Grade 2	Grade 2	Grade 2
Grade 3	Grade 3	Grade 3	Grade 3
Grade 4	Grade 4	Grade 4	Grade 4
	Medulloblast?		
	Medulloblastoma		

no relation between the grade of the tumor and its frequency; thus, most carcinomas of the stomach are Grades 3 and 4, while most carcinomas of the rectum are Grades 1 and 2, and the corresponding prognosis is found in approximately that proportion. Naturally, the grade of the tumor has nothing to do with the surgical hazards involved, and the prognostic significance depends on successful recovery of the patient from the operation. Similarly, it must be recognized that the pathologist can grade only that portion of the tissue which is sent to him by the surgeon, and if this is not representative of the growth the grading may be in error. Broders, realizing that not all parts of a tumor are similar in every case, warned investigators that the grade should depend on the most malignant part of the tumor. It has always been of interest that many workers who object to Broders' four grades are quite willing, as is Willis, to state that a tumor is slightly malignant, malignant or very malignant, a grouping that is really a division into three grades and is based more on the subjective opinion and experience of the individual pathologist than on the more rational classification of Broders.

Since Broders' classification first appeared in 1920 and the basis for the grading of tumors in general had been well established by 1940, why then was grading of brain tumors not proposed until 1949? Several factors appear to have played a part. First of all, large series of gliomas had not been operated on and tissue was not available for histologic study to provide adequate statistical evidence of the validity of grading as a prognostic tool. Second, the Cohnheim hypothesis, with its emphasis on the development of brain tumors from cell rests, and, with it, the consequent belief in the individuality of each type of tumor, was still widely held. Third, neurosurgery was a highly specialized field, with practice confined to a few centers where the neurosurgeon did his own neuropathologic studies or worked closely with a few dedicated persons, so that the complicated classification of the past was not too important.

More important than any of these, how-

ever, was the gradual realization that division of the tumors into special classes because of the presence of one cellular pattern was highly artificial This was noted particularly in the study of the astrocytoma, astroblastoma, spongioblastoma polare and glioblastoma multiforme Throughout this group of tumors the one persistent type of cell is the astrocyte, with greater or lesser numbers of modified tumor astrocytic cells Russell and Bland[1] had already pointed out that the cells of the commonly designated spongioblastoma polare grow in tissue cultures as astrocytes and observed that the cells acquire their peculiar shape by their location between the compressing action of the parallel running heavy axis cylinders in the brain stem, corpus callosum and internal capsule, their sites of predilection In the glioblastoma multiforme all varieties of cells can be found, from swollen astrocytes to bizarre astrocytic forms, but many of these can be found duplicated around infarcts and other areas of cerebral trauma In other words, the similarities within this group of tumors, on closer study, are greater than the differences Similar studies of the ependymoma and oligodendroglioma groups lead to the same conclusion

Finally, about this time, there appeared a need for a classification understandable both to the growing number of younger neurosurgeons and to their associates, the general pathologists Thus it was that a study of grading of astrocytomas and ependymomas was undertaken by Kernohan, Mabon, Svien and Adson,[1] which laid the basis for the grading of cerebral gliomas

It seems pertinent at this point to review the classifications proposed by Bailey and Cushing and those proposed by Kernohan (Tables 1 and 2) As can be seen from Table 2, Kernohan formalized the suggestion previously made by Bailey and Cushing as to the similarity of the astrocytomas, astroblastomas and glioblastomas as part of a group of tumors known as astrocytomas, and divided them simply into Grades 1 to 4 Similarly, he brought together the ependymomas and ependymoblastomas and included with them the more dedifferentiated medulloepitheliomas The oligodendrogliomas are a smaller and less well-defined group, often mixed with astrocytes and ependymal cells both normal and tumor cells, and probably are rarely to be recognized in the higher grades No attempt has been made to alter the classification of the medulloblastomas Knowledge concerning these tumors is still incomplete, though they appear to develop from an embryonic cell in the course of development of the external granular layer of the cerebellum, a proposition which is as yet unproved As for the neuroastrocytoma, considerable differences of opinion exist as to whether this is a distinct pathologic entity within the central nervous system Certainly in the great majority of cases the neurons are misplaced in the growing tumor or are large astrocytes mistaken for tumor neurons so that, the astrocyte being the important cell, the tumors are best classified on the degree of dedifferentiation of the astrocyte

To make the position of the Kernohan classification clearer, it might be well to present it in another form, more closely resembling that of Bailey and Cushing (Table 3) It should be pointed out that it is not assumed that the higher-grade tumors pass through phases of increasing malignancy, as might be assumed by the placing of the terms Though changes in the grade of malignancy have been observed in multiple operations on the same tumor, it appears that in the great majority of cases tumors develop and continue to grow in the same manner throughout the period of their natural history

Finally, as with any classification of tumors, it must be admitted that certain tumors do not seem to fit the classification

Usually these are tumors occurring in infants or young children, and the probability is that the tumor developed from cells before the nervous system had completely developed. Many of these tumors take on the appearance of (a) teratomatous growths or (b) hamartomas.

In conclusion, the grading of gliomas of the central nervous system brings these tumors into line with current theories as to the development and course of tumors of the remainder of the human body and emphasizes the unity of pathologic processes, no matter where they occur.

SUMMARY

The author traces the history of the classification of malignant tumors from the early work of Schwann and Müller down to and beyond Broders' famous classification. His conclusion is that the grading of gliomas of the central nervous system brings these tumors into line with current theories as to the development and course of tumors in other parts of the human body and emphasizes the unity, so to speak, of all pathologic processes wherever they may occur.

RÉSUMÉ

L'auteur fait l'historique de la classification des tumeurs malignes, depuis les travaux de Schwann et Muller jusqu'à la classification mémorable de Broder. Il en conclut que la classification des gliomes du système nerveux central est conforme aux théories admises sur le développement et l'évolution des tumeurs dans d'autres organes, et il souligne l'unité de tous les processus pathologiques à quelque niveau qu'ils se situent.

SUMARIO

O autor traça a história da classificação dos tumores malignos desde o primeiro trabalho de Schwann e Muller até a famosa classificação de Broder e além da mesma. Sua conclusão é a de que o classificação dos gliomas do sistema nervoso central traz êsses tumores de acôrdo com as teorias correntes quanto ao desenvolvimento e curso dos tumores em outras partes do corpo humano e salienta a unidade, por assim dizer de todos os processos patológicos aonde quer que possam ocorrer.

RIASSUNTO

L'autore traccia la storia della classificazione dei tumori maligni, dai primi lavori di Schwann e Muller fino alla famosa classificazione di Broder e oltre.

Egli conclude che la posizione dei gliomi del sistema nervoso centrale è tale da porre tali tumori sulla stessa linea dei tumori di altre parti del corpo e sostiene un concetto unitario per tutti i processi patologici, dovunque essi occorrano.

ZUSAMMENFASSUNG

Der Verfasser verfolgt die Geschichte der Klassifizierung bösartiger Geschwülste, beginnend mit den frühen Arbeiten von Schwann und Müller bis zu der berühmten Einteilung von Broder und darüber hinaus. Er kommt zu der Schlussfolgerung, dass durch die Gruppierung der Gliome des Zentralnervensystems diese Geschwülste mit den bestehenden Theorien über die Entwicklung und den Verlauf von Geschwülsten anderer Körperteile des Menschen in Einklang gebracht werden und hebt die Einheit sozusagen allen pathologischen Geschehens, wo immer es sich abspielen möge, hervor.

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Freedom is not what a man does, nor what he is permitted to do Freedom is part of what a man is

—*Lessing*

A great deal of the joy of life consists in doing perfectly, or at least to the best of one's ability, everything which one attempts to do There is a sense of satisfaction, a pride in surveying such work, a work which is rounded, full, exact, complete in all its parts—which the superficial man, who leaves his work in a slovenly, slip shod, half finished condition can never know It is this conscientious completeness which turns work into art The smallest thing, well done, becomes artistic

—*Matthews*

Unless we can and do constantly seek and find ways and means to do a better job, unless we accept the challenge of the changing times, we have no right to survive and we shall not survive

—*Fischer*

Cesarean Sections in a General Hospital

A Survey: January 1951 - December 1955

HERSCHEL HEINZ, M.D., F.I.C.S.*

NEW BEDFORD, MASSACHUSETTS

ST. LUKE's Hospital in New Bedford, Massachusetts, is a general hospital, serving a city of approximately 108,000 people. In addition, 50,000 people in surrounding towns are serviced by the hospital. It is the only one in the city. The bed capacity is 423, of which 46 are obstetric beds. There are 55 bassinets. All premature babies are now housed on the obstetric floor and cared for by members of the obstetric nursing staff.

The staff of the hospital is composed of surgeons, internists, specialists in the various fields, and general practitioners who have privileges varying with their particular training, skill and ability. Twenty-nine years ago, when I first started the practice of obstetrics and gynecology, privileges in obstetrics were given to any licensed physician who was a graduate of an accepted school, the one exception being that cesarean section could be done only by physicians qualified in surgery. The result of this was that nothing but classic cesarean sections were done. Many years passed before a department of obstetrics was formed and the surgeons reluctantly gave up the performance of cesareans. Even today there are a few hangovers of this period.

During the same era, many deliveries were accomplished at home, a fair percentage by midwives. Prenatal care was poor or nonexistent, and complications were many and serious. Ward service in this hospital was heavy and consisted for the most part of cases too difficult to handle at the patient's home. Today, nearly all deliveries in the city are done at the hospital. Practically all patients are given adequate prenatal care. Ward patients are few, although the number in the Prenatal Clinic is now increasing. Into the hospital family have been absorbed most of the graduates of substandard schools who have been in the area for many years; they are given limited privileges under supervision, including limited obstetric privileges. The result has been a remarkable increase in their knowledge and skill.

When I first started practice, the obstetrics department was part of the medical and pediatric department. Today it is a separate department with seven full-time obstetric specialists, either diplomates of the American Board or qualified for the Board. These men have major obstetric privileges. All others, with a very few exceptions (these being older men who have had major privileges for many years) are limited to minor obstetrics. Minor obstetrics is defined as normal and low forceps deliveries with or without episiotomy, repair of simple laceration, etc. In compli-

*Obstetrician-in-Chief, St. Luke's Hospital, New Bedford.

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TABLE 1.—*Indications for Section*

	1951	1952	1953	1954	1955
Repeat	56	57	64	67	87
Cephalopelvic disproportion	16	34	55	38	37
Premature separation of placenta	16	18	12	8	13
Placenta praevia	11	16	10	12	5
Dystocia	7	7	7	10	8
Uterine inertia	9	15	11	11	
Toxemia not responding to treatment	8	4	13	14	8
Fetal distress	5	5	5	2	7
Prolapsed cord					1
Primiparous breech	2	2			2
Elderly primipara					2
Bandl's ring constriction					2
Fibroid uterus	1	2	1	1	1
Diabetes	1	1	1	1	2
RH factor, erythroblastosis					1
Cardiac decompensation			1		
Abdominal pregnancy	1		1		
Cancer of breast					1
Severe hypertension		2			1
Pelvic tumor		2			1

cated cases, men who have minor privileges must consult with a member of the Obstetrical Staff, this being done without a fee if the particular member selected happens to be on ward service at the time. If delivery by this consultant is requested, a fee may be charged in such cases as make it advisable. The cases of all women requiring cesarean section, whether they are the patients of men with minor privileges or of those with major privileges, require consultations and are thoroughly reviewed at the regular monthly meetings of the department. In my opinion, the statistics presented in the accompanying tables show the wisdom of these requirements.

Table 1 is a list of the indications for section. As one would expect, the most common indication after repeat section is cephalopelvic disproportion. Not all patients undergo roentgen pelvimetric studies, but an increasing number do. The radiologist uses the Colcher-Sussman method. Soft tissue roentgenograms are used to determine the position of the placenta. There is, however, a considerable degree of error, and obstetric experience and judgment have not yet been replaced by the discoveries of Professor Roentgen.

Table 2 shows the five-year totals from January 1951 through December 1955. Broken down, the figures show a gradual decrease in the number of primary sections and an increase in the number of repeat sections, which is to be expected. My department has no formal rule concerning the matter. It is obviously the consensus that once a patient has under-

TABLE 2.—*Five-Year Totals*

	1951	1952	1953	1954	1955
Total deliveries	2,050	2,074	2,034	2,169	2,444
Cesarean (total)	163 = 7.9%	166 = 8%	182 = 8.4%	164 = 7.5%	179 = 7.2%
Total primary	107 = 5.2%	109 = 5.2%	118 = 5.8%	97 = 4.4%	92 = 3.7%
Repeat (total)	56 = 2.7%	57 = 2.8%	64 = 2.6%	67 = 3.1%	87 = 3.5%

Five-year average: Deliveries—10,771

Total percentage of primary sections	4.9%
Total percentage of repeat sections	3.0%
Total percentage	7.9%

gone cesarean section the same is usually done in subsequent deliveries. There are, to be sure, some exceptions.

In suspected cases of placenta praevia, a double set-up is used, and the examination is done in the obstetric operating room, with adequate blood at hand for replacement and all measures taken to do an immediate section if necessary. There is an adequate supply of fibrinogen in the delivery suite at all times.

It should be noted that in 1955 no cesareans were done for uterine inertia, perhaps because of the wider use of intravenous pitocin drip under the constant supervision of the attending obstetrician. By "constant supervision" I mean that the attending obstetrician must sit constantly beside the patient's bed, so that there will be no complications as a result of intravenous administration of pitocin. No cesareans were done for tuberculosis during this period of five years, in contradistinction to the picture some years ago, and only 1 cesarean was performed for probable fetal erythroblastosis. I agree that the mortality rate of prematurity is probably as great as that of erythroblastosis or greater, particularly since our pediatricians are capable of doing replacement transfusions and see the baby as soon as it is born. Only 1 patient with cardiac disease underwent section, which is in contradistinction to the practice some years ago. In 1 case of abdominal pregnancy the fetus was dead but the mother survived. In the other case of abdominal pregnancy a living baby was delivered and the mother died. She had pneumonia and was operated on with general anesthesia (oxygen and ether), although the obstetrician had requested spinal anesthesia.

In the five-year period there were 3 deaths in the hospital, all occurring in 1951. They are as follows: A patient with mitral stenosis and cardiac decompensation was delivered normally and died a few hours later of acute pulmonary edema in spite of all treatment. A second death was due to shock and hemorrhage from a complete separation of the placenta. The patient in this case was given blood transfusion and supportive treatment and placed on the operating table; an incision was made in the abdomen and in the uterus, but she died on the operating table from shock. The third death, not a "cesarean death," was that of a patient with puerperal inversion of the uterus. This patient went into deep shock, was treated with blood transfusions and other supportive measures but failed to respond. The abdomen was opened and the inversion reduced by the Irving technic, in spite of which the patient died a few hours later. Her death is therefore included in the hospital mortality statistics but not as due to cesarean section. In this entire series, therefore, there was only 1 death attributable to this cause, and the patient concerned was almost moribund when she arrived at the hospital. Since 1951 there have been no maternal deaths from any cause. The anesthesia of choice in the majority of cases is spinal, with hyperbaric pontocaine. In some cases the gas, oxygen and ether mixture is given, and in an occasional case local anesthesia is employed. Patients are ambulant on the day after the operation, and the average stay in the hospital is seven days, whereas the average stay in the hospital for patients delivered otherwise than by cesarean section is about three and one-half days. Since adoption of the routine policy of getting patients out of bed as soon as possible after delivery, regardless of the type, the incidence of thrombophlebitis and phlebothrombosis has decidedly decreased.

In this series there were 20 stillbirths among the deliveries by cesarean section, all due to premature separation of the placenta. In addition, a number of premature babies were delivered, usually in cases of placenta praevia, and these were born alive.

SUMMARY

A series of cesarean sections performed in a general hospital between Dec. 1, 1951, and Dec. 31, 1952, is presented. Of a total of 10,771 deliveries, 854 were accomplished by cesarean section, an incidence of 7.9 per cent. Of these, 4.9 per cent were primary and 3 per cent "repeats."

The indications for cesarean section are tabulated with repeat cesarean and cephalopelvic disproportion accounting for the majority.

CONCLUSIONS

At St. Luke's Hospital of New Bedford, Massachusetts, a general hospital, the mortality rate for cesarean section has been brought to the irreducible minimum of zero. The author attributes this to the following factors:

1. The department of obstetrics is staffed with full-time obstetric specialists, qualified by the American Board of Obstetrics or diplomates thereof.

2. Consultation is required before any cesarean section is performed.

3. Hospital staff members who have minor obstetric privileges are required to obtain consultation if any complication arises.

There is a gradual decrease in the number of primary cesarean sections performed in this hospital. The number of "repeat" sections performed is increasing to approximately the same extent.

RÉSUMÉ

Une série de césariennes pratiquées du ler décembre 1951 au 31 décembre 1952 est présentée. Sur un total de 10.771 accouchements, 854 ont été faits par césarienne, soit 7,9%, sur lesquels 4,9% étaient des césariennes premières et 3% des césariennes répétées.

CONCLUSIONS

A l'Hôpital général de St. Luke, New Bedford, Massachusetts, le pourcentage de mortalité de la césarienne a été abaissé au taux irréductible de 0, que l'auteur attribue aux facteurs suivants:

1. Le service d'obstétrique est équipé de spécialistes ayant les qualités requises par l'American Board of Obstetrics, qui y travaillent à plein temps.

2. Une consultation est requise avant toute césarienne.

3. Les membres de l'équipe médicale à prérogatives mineures en obstétrique doivent demander une consultation à la moindre complication.

Le nombre des césariennes premières diminue progressivement à l'Hôpital St. Luke. Celui des césariennes répétées est en augmentation à peu près proportionnelle.

RIASSUNTO

Viene presentata una serie di tagli *cesarei eseguiti in un ospedale generale* fra il dicembre del 1951 e il dicembre del 1952. Su 10.771 parti, 854 furono i tagli cesarei, con una frequenza del 7,9%. Di questi il 4,9% erano primitivi e il 3% ripetuti.

Vengono elencate le indicazioni.

CONCLUSIONI

Al St. Luke's Hospital di New Bedford, Massachusetts, la mortalità per tagli cesarei è stata nulla. Le ragioni di questo fatto sono le seguenti:

1. Il reparto ostetrico è servito da ostetriche specializzate a pieno servizio, diplomate all'American Board of Obstetrics.

2. Viene fatto un consulto prima di eseguire qualunque cesareo.

3. Il resto del personale è invitato a richiedere una consulenza qualunque complicazione si presenti.

Il numero dei tagli cesarei primari tende a diminuire; in quasi ugual misura cresce, invece, il numero dei tagli cesarei ripetuti.

ZUSAMMENFASSUNG

Es wird über eine Serie von Kaiserschnitten, die vom 1. Dezember 1951 bis zum 31. Dezember 1952 in einem allgemeinen Krankenhaus ausgeführt wurden, berichtet. Bei einer Gesamtzahl von 10771 Entbindungen kam es zu 854 Kaiserschnitten, was einer Häufigkeit von 7,9% entspricht. 4,9% waren erstmalige Kaiserschnitte, und 3% wiederholte.

Die Indikationen für die Kaiserschnitte werden in Tabellenform angegeben. Vorangegangene Kaiserschnitte und Missverhältnis zwischen Grösse des kindlichen Kopfes und des mütterlichen Beckens bildeten die Gründe für die Operation in der Mehrzahl der Fälle.

SCHLUSSFOLGERUNGEN

Die Sterblichkeitsquote beim Kaiserschnitt ist im St. Luke's Hospital in New Bedford, Massachusetts, einem allegmeinen Krankenhaus, auf das Minimum von null herabgesunken. Der Verfasser schreibt diese Tatsache den folgenden Umständen zu:

1. Der Ärztestab der geburtschilflichen Abteilung setzt sich aus ganztägig beschäftigten Geburtshelfern zusammen, die vom American Bord of Obstetrics als Spezialisten anerkannt sind.

2. Vor jeder Ausführung eines Kaiserschnittes muss eine Konsultation erfolgen.

3. Ärzte, die am Hospital arbeiten und keine umfangreiche geburtshilfliche Erfahrung haben, müssen mit dem Spezialisten konsultieren, sowie irgendwelche Komplikationen auftreten.

Die Zahl der erstmaligen Kaiserschnitte nimmt in diesem Hospital allmählich ab, während die Zahl der "wiederholten" Kaiserschnitte etwa in gleichem Umfange wächst.

SUMARIO

Uma série de secções cezarianas feitas em um hospital geral entre 1 de dezembro de 1951 e 31 de dezembro de 1952, é apresentada. De um total de 10,771 partos, 854 foram feitos por cezariana, uma incidência de 7.9%. Destas, 4.9% foram primárias o 3% "repetidos."

As indicações para a secção cezariana são tabuladas com cezarianas repetidas sendo a desproporção cefalopélvica responsável pela maioria.

CONCLUSOES

No Hospital St. Luke em New Bedford, Massachusetts, hospital geral, a média de mortalidade na cezariana foi reduzido para zero. O autor atribui tal fato aos seguintes fatores:

1. O departamento de obstetricia conta com especialistas obstétricos, qualificados pelo American Board of Obstetrics ou diplomados de lá.

2. Exige-se consulta antes que se faça qualquer cezariana.

3. Os membros do "staff" do hospital que tem previlégios obstétricos menores são obrigados a fazer consulta no caso de surgirem complicações.

Há uma diminuição gradual no numéro de cezarianas primárias feitas no hospital. O número de secções "repetidas" feitas está aumentando aproximadamente para o mesmo número.

Dysmenorrhea

A Clinical Study

PIERRE E MEUNIER, M D, F I C S

MONTREAL QUEBEC CANADA

IT is not my intention to try to solve the problem of functional dysmenorrhea The sole object of this article is to present a study of 200 cases, based on clinical observation

Functional dysmenorrhea is a complex subject, to study it one must first eliminate all organic lesions a difficult task and one in which a high percentage of error is to be expected This necessary preliminary phase accomplished, it is essential to distinguish three major varieties of functional dysmenorrhea

1 Functional dysmenorrhea *per se*, i e, true disturbance of the menstrual phenomena

2 Functional dysmenorrhea of psychogenic origin

3 Pseudodysmenorrhea, with which extragenital pain is aggravated during the menses

The physiologic aspects of menstruation need not be discussed here One should remember, however, that progesterone and corpus luteum are prerequisite to functional dysmenorrhea To this, few supplementary considerations need be added

I If anovulatory cycles are occasionally (rarely) painful, this is due to one or another, or to several of the following causes

1 A thin uterine mucosa, with minimal fragments to be eliminated

2 A diminished degree of uterine congestion

3 Uterine contractions that are smaller than usual and may even be fibrillating

4 Menstrual debris and blood of lower toxicity than is usual

II When one studies functional dysmenorrhea, one quickly realizes that none of the currently accepted and propounded theories is applicable in all cases of functional dysmenorrhea and that clinical judgment, as always, is the best guide to their pathogenesis As a matter of fact, this clinical entity presents itself under a variety of pictures, each with a different cause, for example, obstructive dysmenorrhea, with which there is an obstacle to the menstrual flux during the first few hours of menstruation cannot have the same cause as nonobstructive dysmenorrhea, in the presence of which there is no barrier to the flow

I have used this concept of obstruction as a basis for division in my study of functional dysmenorrhea Thus, I suggest two categories (a) obstructive functional dysmenorrhea and (b) nonobstructive functional dysmenorrhea

Obstructive Functional Dysmenorrhea —MacIntosh, a century ago, said *"Nulla dysmenorrhea nisi obstructiva"* Since then, numerous theories have been advanced Today, many authors reject the theory of obstruction and try to explain functional dysmenorrhea by a phenomenon of "vasoconstriction" It is pure illusion to group all types of functional dysmenorrhea under this one heading Some types are due to vasomotor crises and curable by vasodilators, but there is also an obstructive type with which there exists a barrier to the flow and the pain disappears when the flow begins On this

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type the vasodilators have no effect. Such "obstructive functional dysmenorrhea" can be distinguished from obstructive organic dysmenorrhea (cervical stenosis) by the fact that the pain is not always the same, being lessened by rest, exercise, etc.

Since the pain is visceral, it is difficult to localize. The patient usually complains of hypogastric pain. A unilateral pain is usually organic.

What then, are the causes of obstructive functional dysmenorrhea? The following suggestions have been advanced:

1. *Uterine debris:* It is known that the uterine mucosa is much thicker when ovulation has taken place than when the cycle has been anovulatory. It is possible that the cervix could be obliterated by large mucosal fragments, for every gynecologist knows the type of dysmenorrhea commonly known as membranous, with which the uterine mucosa is expelled *in toto*. This classic form, however, is rare. One is more likely to encounter the exfoliative type, with which the mucosa is expelled in large fragments. I have never encountered any modification of the uterine mucosa in the few cases of this type of dysmenorrhea that I have observed.

2. *Bloddy clots and uterine distention:* Many patients state that they have violent pains until they have passed a clot, which phenomenon may be repeated many times during menstruation. Most of these women notice, at the same time, modifications in the menstrual flux, such as hypomenorrhea or menorrhagia.

When there is hypomenorrhea, the association of pains and clots is difficult to explain and presents a different therapeutic problem.

When there is menorrhagia, the pain seems to be due to uterine distention with transitory and repeated hematometria. The uterine cavity is only nominally a cavity, but under certain circumstances, such as hyperthrophy, submucous fibroma, sclerosis or retroversion, it may become a real cavity in which blood accumulates and clots. This variety of dysmenorrhea is more organic than functional.

3. *Congestion:* Uterine congestion is much more intense in ovulatory than in anovulatory cycles. Congestive functional dysmenorrhea has been known for centuries, and congestion, without a doubt, is an important etiologic factor. Clinically the patient complains of painful premenstrual tension and of dysmenorrhea, most frequently of the obstructive type. From the time of ovulation, such a patient feels abdominal tension and pain which increases progressively until menstruation has begun.

Congestion is produced by many factors: (1) local factors, such as retroversion, chronic infection, cervicitis, increase of intra-abdominal pressure or constipation; (2) hormonal factors, e.g., hyperestrinism; (3) sexual factors, and (4) psychic factors.

Together or separately, these factors create an increase in the physiologic congestion that accompanies menstruation. For example, cervicitis may cause secondary obstructive dysmenorrhea in multiparae; a simple electrocoagulation will cure the cervicitis and the accompanying dysmenorrhea. In other cases congestion may be relieved by the correction of retroversion; by a reducing diet, which will diminish the intra-abdominal pressure; by adequate treatment of constipation; by physical exercises, or by normal sexual behavior.

4. *Spasms of the isthmus:* Spasmodic dysmenorrhea is a very old entity, and many authors have endeavored to prove its existence; Claude Beclère, for instance, by hysterographic methods, and Bickers by manometric tracings on an intrauterine bag. It has been demonstrated that, during the luteal phase, the tonus decreases while the amplitude of the uterine contrac-

tion is increased. Bickers tried to show that in the presence of spasmodic dysmenorrhea there is an increase of the tonus, frequency and amplitude of the uterine contractions. This pseudotetany of the uterus is resistant to treatment by estradiol, progesterone, atropine and ephedrine but reacts to morphine and pavatrine. Because of the increased uterine tonus, progesterone has been used as a therapeutic agent in cases of spasmodic dysmenorrhea, but generally without success. Estradiol, on the other hand, seems more successful. If it is given from the tenth to the twenty-fifth day of the cycle, it helps to soften the cervix and menstruation is usually much less painful, if painful at all.

During the past few years other theories have been advanced, among them that of the "meno-toxin." It is quite possible that these toxic substances produce a spastic reaction. When one realizes that the cervix is rich in neuroganglionic elements, this theory becomes quite plausible. Keiffer has demonstrated, under the cervical mucosa, numerous sensory nervous corpuscles, and has described a "trigger pain area" at the periphery of the sphincter. Thus, the correlation between pain with menotoxin, a hypertonic cervix and ovulatory menstruation, is strengthened by the fact that anovulatory cycles are painless, with a very small output of menotoxins.

A theory somewhat analogous to that of the menotoxin is that of the "metra-allergies." This term is used by those who consider dysmenorrhea an allergic phenomenon, with local edema of the genital tract and other manifestations. The basis of this theory is the fact that, when epinephrine or an antihistamine such as benadryl is administered during an acute crisis, the pain is often alleviated, and also, on a clinical observation that sudden anger or emotion will cause the pain to disappear.

Nonobstructive Functional Dysmenorrhea.—Let us now consider nonobstructive functional dysmenorrhea, with which no impediment to the menstrual flow seems to exist. The pain may be initial, of short duration, or it may last all through the menstrual period. When the pain is initial and when there is no impediment to the flow, the pain may be considered due to a vasomotor crisis (angiospasm). Physiologic knowledge of menstruation indicates that necrosis of the uterine mucosa is preceded by vasoconstriction of the terminal spiral arteries. This vasoconstriction is not necessarily limited to the functional layer of the uterine mucosa, for it may extend to the whole utero-adnexial-arterial system. Is this phenomenon due to Smith's menotoxins, or to pitressin liberated because of a decrease in estrogens? Nobody knows, but the therapeutic results certainly show that vasodilatators, such as priscoline, have a salutary effect. It may also be argued that section of the presacral nerve is effective, partly because of the vasodilatation consequent upon sympathectomy. This vasomotor theory is in vogue at present, but it must not be unconditionally accepted.

On the other hand, when there is a constant, steady pain throughout menstruation, one may consider it due to "relative ischemia" of the myometrium. Such conditions as uterine hypoplasia, hypotension and hypothyroidism may cause a decrease in myometrial circulation and in metabolic values.

In the presence of hypoplasia there is insufficient vascularization, and Novak has expressed the opinion that relative impermeability of the blood vessels exists.

Occasionally, hypotension may be the cause of dysmenorrhea. Moire stated that the uterine contractions are capable of preventing arterial pulsations; it follows that if hypotension exists t dsation will be impeded with greate' gynecologists, however, know

hypotension and without dysmenorrhea.

Hypothyroidism is a much more frequent cause of nonobstructive functional dysmenorrhea, and the excellent results of thyroid extract are well known.

Finally, the "anoxia" of the myometrium may be due equally to the poor quality of the circulating blood, as with chloroanemia. The good results of iron therapy here are too well known to need discussion.

This concludes a brief analysis of functional dysmenorrhea, for successful treatment of which an improved clinical understanding is needed. A considerable amount remains to be added on the psychic factors involved, which are highly relevant but lie beyond the scope of this article.

SUMMARY

The author discusses functional dysmenorrhea, obstructive and nonobstructive, which he classifies as (1) true functional dysmenorrhea with disturbances of the phenomena of menstruation; (2) functional dysmenorrhea of psychogenic origin, and (3) pseudodysmenorrhea, with exaggeration of extragenital pain during the menstrual period.

The obstructive condition is associated with clotting, uterine debris, a distended uterus, congestion (local, hormonal, sexual or psychic), spasms of the isthmus, and toxic or allergic menstrual disturbances. With the nonobstructive type there are initial pain, vasomotor crises (angiospasm), ischemia, hypoplasia, hypotension, hypothyroidism and myometrial anoxia.

RÉSUMÉ

L'auteur discute la dysménorrhée fonctionnelle obstructive et non-obstructive, qu'il divise comme suit: 1) dysménorrhée fonctionnelle vraie avec troubles des menstruations, 2) dysménorrhée fonctionnelle d'origine psychogénique, 3) pseudo-dysménorrhée avec exacerbation des douleurs menstruelles.

La dysménorrhée obstructive s'accompagne de coagulation sanguine, de débris utérins, d'un utérus distendu, de congestion (locale, hormonale, sexuelle ou psychique), de spasmes des isthmes, et de troubles menstruels toxiques ou allergiques. La dysménorrhée du type non-obstructif est caractérisée par les symptômes suivants: douleurs, crises vasomotrices (angiospasmes), ischémie, hypoplasie, hypotension, hyperthyroïdisme, anoxie de la musculature utérine.

RIASSUNTO

L'autore tratta delle dismenorree funzionali, ostruttive e non ostruttive, e le classifica in (1) dismenorree funzionali vere con disturbi dei fenomeni del, mestruo; (2) dismenorree funzionali di origine psichica e (3) pseudodismenorree, con esagerazione del dolore extragenitale durante il periodo mestruale.

Le condizioni ostruenti sono rappresentate dalla coagulazione, dai detriti uterini, dalla distensione dell'utero, dalla congestione (locale, ormonale, sessuale o psichica), dagli spasmi dell'istmo, dai disturbi mestruali tossici o allergici.

Il tipo non ostruttivo comprende il dolore iniziale, le crisi vasomotorie (angiospasmo), l'ischemia, l'ipoplasia, l'ipotensione, l'ipotiroidismo, l'anossia miometrale.

SUMARIO

O autor discute a dismenorreia funcional, obstrutiva e não-obstrutiva, que classifica como (1) dismenorreia funcional verdadeira com distúrbios dos fenômenos da menstruação; (2) dismenorreia funcional de origem psiquicogênica, e (3) pseudodismenorreia, com exagero da dor extragenital durante o período menstrual.

A condição obstrutiva está associada

com coagulação, fragmentos uterinos, útero distendido, congestão (local, hormonal, sexual ou psíquica), espasmos do istmo, e disturbios menstruais toxicos ou alérgicos Com o tipo não obstrutivo ha dor inicial, crises vasomotoires (angioespasmo), isquemia, hipoplasia, hipotensão, hipotiriodismo e anoxia miometrial

ZUSAMMENFASSUNG

Der Verfasser erortert die funktionelle Dysmenorrhoe mit oder ohne Bestehen von Obstruktion und gibt folgende Gruppeneinteilung

1 Die echte funktionelle Dysmenorrhoe mit Storungen der Menstruationserscheinungen

2 Die funktionelle Dysmenorrhoe seelischen Ursprungs

3 Die Pseudodysmenorrhoe, wo Schmerzen extragenitalen Ursprungs wahrend der Menstruation in ubertriebenem Masse auftreten

Die obstruktive Form der Dysmenorrhoe geht mit Klumpchenbildung einher, mit Zelltrummern in der Gebarmutter, Erweiterung des Uterus, Stauung (lokalen hormonalen, sexuellen oder seelischen Ursprungs), mit Krampfen des unteren Gebarmuttersegments und mit toxischen oder allergischen Menstruationsstorungen Bei der nicht obstruktiven Form werden Schmerzen bei Beginn der Periode, vasomotorische Krisen (Gefasskrampfe) lokale Blutarmut, Hypoplasie, Hypotonie, Hypothyreoidismus und mangelhafte Sauerstoffversorgung der Gebarmutter muskulatur beobachtet

Victory over things is the office of man Of course, until it is accomplished, it is the war and onslaught of things over him His continual tendency, his great danger, is to overlook the fact that the world is only his teacher, and the nature of sun and moon, plant and animal only means of arousing his interior activity Enamored of their beauty, comforted by their convenience, he seeks them as ends and fast loses sight of the fact that they have worse than no values that they become noxious, when he becomes their slave

—*Emerson*

When a man stupid becomes a man inspired, when one and the same man passes out of the torpid into the perceiving state, leaves the din of trifles, the stupor of the senses, to enter into the quasi omniscience of high thought—up and down around, all limits disappear No horizon shuts down He sees things in their causes all facts in their connection

—*Emerson*

Orthopedic Surgery

Immediate Treatment of the Injured Hand

PRESTON J. BURNHAM, M.D., F.A.C.S., F.I.C.S.*

SALT LAKE CITY, UTAH

THE injured hand poses many problems that are not encountered in other parts of the body. Anatomic knowledge plus familiarity with the physiopathologic processes of the body, especially of the superspecialized structures of the hand (tendons, nerves, skin, small bones, and joints of these easily traumatized nondistensible tissues) help in the surgical treatment of the hand.

Since the practice of medicine or surgery is an art based on science, and since the treatment of trauma is predicated upon the several individual injuries incurred, few axioms may be set down as guides. The following suggestions seem to be the most useful.

Preanesthetic Examination.—This procedure, if carried out without haste on the still sentient and responsive patient, immediately permits the surgeon to outline his surgical procedure, shows him injuries that would have taken protracted operating time to find on the anesthetized patient, and saves the hand from unnecessary probing and exploring. Such an examination includes: observation without the dressing, palpation of the structures beneath unbroken skin only, careful neurologic testing, and, above all, a demonstration by the patient of his abilities and inabilities in the active use of all structures.

The wound need not and must not be probed, retracted or otherwise manipulated until it and the surgeon have been surgically prepared and draped!

Anesthesia.—It has always seemed senseless and cruel to me to scrub an open cut anywhere on the body with soap, water, alcohol, ether, tincture of green soap, iodine or the detergents, and *then* inject procaine hydrochloride through the raw edges of the skin with many jabs of the needle in order to suture. Not only is the procedure inhuman, but it is against surgical principle to push a needle deliberately through a potentially contaminated area of fat and muscle into healthy tissue.

If the wound is sufficiently small to warrant a definitive surgical procedure with the region under local anesthesia, I always establish a regional block through one needle injection neurologically proximal to the wound before I touch the wound itself. This procedure is based on two principles:

1. One can approach surgical sterility more closely on unbroken skin than on abraded skin or raw subcutaneous tissues (if one refrains from causing damage to the raw tissues). It is therefore safer to insert a needle through the unbroken skin.

2. It is a human approach. If any slightest indication for general anesthesia exists, however, such as protracted operating time, suture of deep structures or open reduction of a fracture, I always use general anesthesia.

A Bloodless Field.—Whether or not to use a tourniquet is often a grave question. Actually it is quite simply solved: If gen-

*Clinical Instructor in Surgery, College of Medicine, University of Utah; Attending Surgeon, St. Marks Hospital; Consultant in Surgery of the Hand, Crippled Children's Service.

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eral anesthesia is used, the tourniquet is always employed, high on the upper arm. If local anesthesia is used, the tourniquet cannot be applied.

The traditional rubber band at the base of the finger constitutes a serious threat to the circulation and should never be used. Also, bleeding constitutes such a serious threat to good surgery that the tourniquet plus general or brachial block anesthesia must always be employed on injuries that involve the repair of much more than the skin.

Surgical Cleansing.—Drs. Koch and Mason have long since established the efficacy and gentleness of prolonged cleansing of the anesthetized tissues with mild white soap and water applied with sterile scrub gloves on sterile wads of cotton. Such a technic relies upon the saponification of greasy débris, the mechanical cleansing effect of the soapy cotton, the dilution factor of bacteriology, and above all the principle that healthy nontraumatized raw tissues have a tremendous resistance to the isolated bacterium that may be left in its depths after any type of cleansing.

Physiologically Moist Tissues. — When one considers the state of raw muscle, nerve, tendon, and fat exposed either to the air or to dry sponges used throughout an operation of any length, one pictures the wet, vibrantly alive fish that is caught in the morning and is left on the rocks or on the deck in the sun all day. Very shortly it curls, changes color and stiffens. Should it miraculously come to life again in the evening, this layer of desiccation-killed tissue would be sloughed off or replaced by an encasing fibrous cicatrix.

Tissues protected only by their cell membranes will show the early changes of desiccation. The fibrosis one wishes to prevent thereby becomes inevitable. It is, therefore, imperative that tissues be kept constantly moistened throughout the operative procedure.

Grafting Tissues.—Tissues cut free of their normal bed are potentially dead. They can survive only under the best environment of circulation and asepsis. The only exception is the thin split thickness skin graft, which will "take" even in the presence of moderate infection.

This means, then, that free grafts of tendon, nerve or bone cannot be made at the time of trauma. Such procedures must be delayed until sound healing has taken place. Full thickness skin grafts, however, may be used at the time of initial surgical treatment, provided that the bed is well vascularized, that the wound is "clean" and seen early, and that a proper surgical preparation has been done.

Fractures.—The reduction of fractures takes first place in the sequence of repairs of trauma of the hand. Whether tendons or nerves are repaired or not at time of initial operation, the fracture fragments should be fixed then, because (1) rapid healing makes subsequent repair difficult and (2) the fact that very minor displacements in angulation or rotation of these tiny bones reduces the efficiency of manual function makes it mandatory to reduce them at the optimal time, which is immediately.

Injured Tendons.—Sutures can no more hold tendons together against tension than they can hold unsplinted fractured bones.

Tendons are too often treated as inanimate rope. Sutures are therefore heavy, and much material is sewn back and forth throughout an inch or so of each severed end of the tendon in an effort to splice it strongly.

This is a completely erroneous approach to the treatment of tendons. First, when massive amounts of suture are used, the foreign body acts as an irritant and fibrosis ensues. Second, the tight masses of suture strangulate an already precarious blood supply. Loss or reduction of that circulation leads to necrosis, which is followed [illegible] is that [illegible] wishes to

prevent. Third, sutures placed under tension in tendons soon slough through, as they do when placed under tension in any other living tissue.

In the suture of tendons, "position is everything." The surgeon places the ends in approximation only after he positions the wrist and fingers—all in acute flexion when the flexor tendon has been cut, or in moderate extension when an extensor tendon has been cut. The position will hold the ends of the tendon together. Fine, delicate sutures are used sparsely only to maintain the needed intimate contact of the fibers that might otherwise grow wildly past the anastomosis or tightly to the surrounding tissues.

Injured Nerves.—"Always tie a piece of black silk through each end of the cut nerves so that they can be found later, and close up the skin." This time-honored cliché is a paradox.

If the patient with a severed nerve presents himself before the wound is eight hours old, the wound should be cleansed and the nerve sutured. If the wound is extraordinarily contaminated and/or more than eight hours old, the usual surgical preparation is carried out but only the skin is closed.

The problem is not whether the nerve will or will not heal. It is a problem of bacteriology. Properly approximated peripheral nerves will heal together and reinnervate the distal tissues in the absence of infection. Sutured nerves in the presence of infection will become most purulent at the site of anastomosis, because of the presence of foreign bodies, i.e., sutures.

Therefore, if clinical judgment indicates suturing, I suture. If there is imminent danger of the development of infection I do not suture, nor do I place "identifying sutures" (which are no different from anastomosing sutures) in the nerve ends.

Compression Dressing. — I have seen many operative sites closed with one of the surgical team leaning with all his weight upon the wound to keep the blood in! This is not the reason for the compression dressing that is used after an operation upon the hand. Rather, this desperate situation is prevented by careful homostasis.

Postoperative compression dressings are used to promote the circulatory exchange in this way:

All manipulation of living cells is attended by trauma, whether it is caused by unplanned phenomena, such as accidents, or by surgical intervention. Such trauma is attended by subsequent transudation of tissue fluids from the unbroken but exposed cells and by exudation of fluids from those cells, with disrupted membranes. Such trauma is also attended by the accumulation of fluids in the intercellular spaces and in the cells themselves. Collections of fluid within the wound prevent coaptation and healing. The deposition of edema reduces circulation severely and, if uncontrolled, will so increase as to make the tissues hard, reduce lymph, venous and arterial circulation to zero and result in gangrene.

A firm but resilient fluffed gauze dressing held on by an overall woven elastic bandage prevents the formation of edema and the collection of serum, but need not be applied so tightly as to embarrass the circulation.

Postoperative Splinting.—I should never expect a fractured bone to heal without immobilization. There would be constant disruption of proliferating capillaries and bone, as well as a constant state of edema and reduced circulation due to constant irritation of the site of injury. Nor can I, for similar reasons, expect rapid sound healing of normal tissues to occur in injured hands without immobilization. All injuries of the hand, with the exception of minor skin lacerations, are permitted better healing if the hand is splinted.

Mason aluminum splints for mainte-

nance of the functional position are usually ideal for massive injuries Fractures, too, are splinted along with the remainder of the bones in the ray in a "position of rest" in which all muscle tendon tensions are reduced to a minimum Lacerations of skin, tendon and nerve demand that the hand be splinted so that the least possible tension is present Rest is then essential, as it is to the healing of all tissues

Elevation —Trauma to tissues, whether inadvertent (caused by external violence) or definitive (caused by surgical maneuvers) always leaves incipient edema in its wake Edema then increases the tissue pressure, which in turn compresses the lymph channels The edema increases as a sequence of lymph stasis, and the tissue pressure closes the venous return

A reduced venous return then results in venous stasis or a further loss of fluid into the cells and interstitial spaces, until ultimately the skin of the extremity is hard, stretched and shiny Arterial shutoff is then rapidly followed by frank gangrene

Arrest of further formation of edema at any stage short of complete vascular shutoff, even though it does not lead to gangrene, slows the processes of healing, increases the chance of bacterial invasion because of lowered tissue resistance and is followed by fibrosis in all the edematous tissues

It is imperative that the repair of major traumas in the hand be followed by elevation of the extremity for the duration of the edematous diathesis, which is two to four days unless the injury is severe

The patient with a major trauma is kept flat in bed for this period, with his arm and hand nearly in a straight line from his shoulder, at an elevation of 45 degrees from his torso The patient with an injury that does not keep him in the hospital is ordered to keep his hand at the level of his ear for this period

SUMMARY

The treatment of injuries to the tissues of the hand can be followed by a high degree of successful healing and function Such wounds, if treated in the traditional way of "minor surgery," lead to major disasters Similar wounds to these delicate specialized structures, when treated as major surgical problems, however, leave but minor incapacities

RÉSUMÉ

Dans les cas de lesions des tissus de la main l'auteur a obtenu un pourcentage eleve de guerisons et de recuperation fonc tionnelle Il attribue ces succes au fait qu'il recourt de preference a des moyens operatoires majeurs Il souligne l'impor tance des facteurs suivants examen preanesthesique, preparation meticuleuse, an esthesie prudente, champ operatoire exsangue, necessite de maintenir les tissus physiologiquement humectes, valeur et ap plication judicieuse des greffes Le traitement des fractures de la main, des lesions des tendons et des nerfs, et l'utilisation des attelles et de pansements speciaux sont decrits L'auteur estime que chaque stade traitement necessite une attention aussi minutieuse que lors d'une operation majeure

RIASSUNTO

Nella pratica dell'autore la cura delle lesioni delle parti molli del capo fu in genere seguita da guarigioni soddisfacenti dal punto di vista anatomico e funzionale Egli ritiene che tale successo sia dovuto al fatto che egli tratta tali lesioni con interventi accurati esame minuzioso della ferita o della frattura, preparazione me ticolosa, anestesia adatta, chirurgia incru enta, mantenimento dei tessuti in un grado di umidita fisiologico, viene data molta

importanza ai trapianti e al loro uso appropriato.

Viene trattata anche la metodica del trattamento delle fratture della mano, delle ferite dei tendini e dei nervi, l'uso delle stecche e delle fasciature compressive. In ogni momento si deve essere attenti e accurati come durante ogni intervento di grande chirurgia.

SUMARIO

Na prática do autor o tratamento de lesões aos tecidos da mão é em seguido de alto grau de cicatrização e função bem sucedidas. O autor isso atribui ao fato de que trata tais lesões mais em uma base operatório.

O exame preanestésico da ferida ou fratura, a preparação meticulosa, a técnica anestésica cuidadosa e adequada, a operação em um campo exangue e a necessidade de se conservar os tecidos fisiológicamente úmidos são salientados, e a significação dos enxertos e seu uso apropriado ressaltada. O tratamento das fraturas manuais, as lesões aos tendões e nervos, e o uso de talas e ataduras de compressão, são revistos. Em tôdas as partes do tratamento, o autor está convencido de que a compreensão e atenção aos detalhes são tão imperativos como a realização de qualquer grande operação.

ZUSAMMENFASSUNG

Der Verfasser sieht, dass in seiner Praxis Behandlung von Handverletzungen im allgemeinen zu höchst erfolgreicher Heilung und zu Wiederherstellung der Funktion führt. Er schreibt diese Beobachtung der Tatsache zu, dass er die Behandlung solcher Verletzungen auf einer verhältnismässig breiten operativen Basis aufbaut. Er legt Wert auf Untersuchung der Wunde oder des Bruches vor der Anästhesierung, auf peinlich genaue Vorbereitung, auf sorgfältige und dem Falle angemessene Technik der Anästhesie, auf Ausführung der Operation in blutleerem Gebiet und auf physiologische Feuchthaltung der Gewebe. Er weist auf die Bedeutung von Transplantaten und ihrer richtigen Anwendung hin und gibt einen Überblick über die Behandlung von Handbrüchen, Sehnen-und Nervenverletzungen und über die Anwendung von Schienen und Kompressionsverbänden. Der Verfasser ist überzeugt, dass in jeder Phase der Behandlung Umsicht und Beachtung aller Einzelheiten genau so unerlässlich sind wie bei allen grösseren Operationen.

Let us never forget that every station in life is necessary; that each deserves our respect; that not the station itself. but the worthy fulfillment of its duties does honor to man.

—*Lyon*

Advances in Plaster Technics

EVERETT J. GORDON, M.D., F.A.C.S., F.I.C.S., D.A.B.

WASHINGTON, D. C.

THE use of some type of immobilizing material dates to the earliest days of mankind. As far back as 1600 B. C. the Egyptians had advanced beyond the use of permanent wooden splints and had used bandages impregnated with gums and waxes in order to provide protection. Actually, calcine gypsum or plaster of paris was known to the early Egyptians, who were accustomed to coating the interiors of tombs as early as 4000 B. C.

Hippocrates used bandages impregnated with wax and resin; a similar material, made of lime and egg white to stiffen bandages, was employed by Europeans up to the sixteenth and seventeenth centuries. Rhazes of Arabia describes the use of egg white in the ninth century, and other reports indicate that its use continued as late as 1834, with modifications such as those devised by the French, who added ground-up blotting paper to increase its hardness.[1]

In 1828 liquid plaster was used, the limb being encased in a wooden box and plaster poured about it, with later removal of the box; a somewhat similar system is reported as used even earlier in Bokhara (1798). Heavy starch splints were used by Baron Suetin in 1834, who removed the splints to observe and dress the wound. The first to report the use of bandages impregnated with plaster of paris was Matthysan, a Dutch army medical officer, in 1852, and these continued to be employed throughout the Crimean War. By 1900 plaster of paris was generally accepted and had largely replaced the earlier types of splint, such as starch bandages, paraffin bandages, etc.

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In the early 1930's Lorenz Bohler,[2] the eminent Austrian orthopedic surgeon, and the British Medical Association Fracture Committee in its 1935 Report,[3] demonstrated and described the efficacy and economy of functional use of fractured limbs as a means of getting injured workers back to work quickly with a minimum of physiotherapy and rehabilitation and the lowest possible drain on insurance companies for compensation. This was possible only with quick setting, light, yet exceptionally strong plaster of paris in the modern plaster of paris bandage.

Plaster of paris is powdered, dehydrated gypsum, derived from rock imbedded in the ground, like limestone and other rocks. The various deposits of gypsum vary in purity and in content. The more impure types are used for building purposes, and the pure white gypsum is reserved for medical and dental purposes. Gypsum varies in quality according to geographic deposits, some varieties lending themselves more favorably than others to use in plaster of paris bandages. That used in the Gypsona® bandage, obtained from a special quarry in England, is peculiarly well suited to its purpose. Gypsum, in its natural state, is a hydrous crystalline calcium sulfate containing four-fifths calcium and one-fifth water. The gypsum is prepared for medical use by dehydration and addition of an accelerating or retarding agent, depending upon the type of plaster to be manufactured and the purpose for which it is intended. Setting time may be accelerated to three to five minutes or retarded as much as twenty to thirty hours (as used in the building trades). The acceleration is usually secured by the addition of so-

dium chloride or gypsum crystals when the plaster is for medical use; when it is used commercially, such substances as animal hair, horny organic material, gelatin or vinegar are added to slow down the hardening process by exerting a protective colloid action.[4] The setting action of plaster after wetting is actually a process of crystallization that continues until complete, as evidenced by the complete drying out of all water.

During the first World War, plaster of paris was not generally used in the combat zones in the treatment of fractures or compound wounds. It was not until the Spanish Civil War, in 1936-1937, that Trueta popularized its extensive use for the treatment of compound war injuries.[5] After his excellent results and experiences became known, plaster of paris had exceedingly wide use in World War II and was the principal agent of immobilization in transportation of the wounded. It greatly aided quick evacuation of the wounded from the fighting zone to the interior for more definitive care, making combat medical units more mobile, increasing the patient flow, and thereby increasing the volume of medical service.

Among the first of the newer plastic materials offered as a substitute for plaster of paris was "Castex Rigid Bandage," composed of alkyl cellulose pyroxylin, C.P. boric acid, C.P. acetone (voltaile solvent), and surgical gauze, each bandage supplied in individual cans. The advantages of water resistance and lightness were more than offset, however, by frequently encountered sensitivity to the lacquer on the patient's skin and the surgeon's hands; the delayed setting time (thirty to sixty minutes); the irritating odor; the inflammability of acetone in a closed room; increased storage space required for the individual cans, and the high cost. The inconvenience of an additional application of lacquer the following day also presented a serious drawback.

Later, in the search for a substitute for plaster, a form of glass plastic bandage, dipped in a special solution of acetone base, was introduced under the name "Aire-Cast," later changed to "Aire-Lite." It was advocated for its extremely light and porous construction, transparency to roentgen rays and imperviousness to practically all liquids commonly encountered, so that the patient could bathe and use the cast even while swimming or ocean bathing. The "Aire-Lite" bandage is made from fine strands of fiberglas and cellulose acetate which, when set, comprise a smooth inner glass and cellulose acetate cylinder. This bandage has been used extensively, but much of its initial popularity has been lost because of several disadvantages, such as the need for very fast application to prevent layering, and the very slow drying time (forty-five minutes to an hour even with the use of an expensive heater-blower apparatus). This results in loss of time to both the patient and the doctor, with retardation of use of the plaster room. Frequently the bandage sticks together after immersion and cannot be applied smoothly in layers, because of the adherence of one layer to another. Also, the stockinette and felt padding, although treated to be water-repellent, is usually not water-repellent; when the cast is immersed in water the patient often complains that the lining is soggy and wet for many hours afterward, which makes this feature rather impractical even though the cast itself remains intact. Occasional cases are encountered of cutaneous irritation from the setting fluid, with severe pruritus beneath the cast, sometimes requiring its premature removal. In addition to the high cost, the odor of ether and acetone makes its use rather impractical in small closed rooms and prevents use of the room for some time thereafter. However an "Aire-Lite" cast has certain advantages, owing to its extreme lightness and imperviousness—e.g., it permits roentgen

examination without removal of the cast

Both "Aire Lite" and "Castex Rigid Bandage" casts have the disadvantages of being difficult to wedge for correction of position, since it is difficult to apply the additional bandage and secure good adherence In addition, both are apt to wrinkle during the long setting process unless meticulous care is exercised by the assistant who holds the extremity Wrinkling must be avoided to prevent pressure areas and resultant local ulceration of the skin

Recently, melamine resin bandages have been introduced Melamine was tried first as a chemical added to water for immersion of the regular plaster bandage, later it was modified as bandages impregnated with resin to be immersed in plain water These bandages eliminate the need of a special pail for the sticky residue, which is difficult to cleanse from the container Melamine resin bandages are now in popular use and have certain advantages over regular plaster They are water-resistant (although not completely waterproof), light, firm and durable Little plaster is lost in the wetting process, which means that almost the entire plaster content of the bandage is utilized and incidentally that the risk of the blocking of drains by the discarded water is reduced Reactions to the resin are occasionally encountered, however, both by the patient and by the surgeon, and the finish is a dull, dirty gray, which does not give the shiny, smooth appearance obtained with a well-finished regular plaster cast Melamine resin ("Melmac") casts are difficult to cut and will dull plaster knives, shears or electric cast cutters There are, however, definite indications for their use, and they have their advantages, especially for children Frequent wetting from urine may soil a hip spica cast, for example, and require frequent changes of the cast, with the attendant risk of loss of position in a difficult correction

In addition to the various plaster substitutes, there are several types of plaster of paris available These include molding plaster, with a setting time of thirty minutes, which makes a dense, firm cast, alabaster plaster, similar to molding plaster but whiter, and more expensive because of the more careful selection of rock material, and dental plaster, with a setting time of thirty minutes, generally used in plaster of paris bandages for medical use, with a setting time ranging from two to fifteen minutes, depending on the addition of accelerating agents

There are many factors and variable situations that may make the choice of a particular grade or brand of plaster important to the successful achievement of the purpose desired In the military, a material that produces a strong, light cast will conserve supplies, transportation facilities and personnel time, thereby increasing effectiveness and combat use A light strong cast is important for such patients as an elderly woman with a Colles fracture, daily activities and exercises for the elbow and shoulder are facilitated, which prevents adhesions and improves local circulation and muscle power, with the cast still holding the desired position In walking heel casts knee cylinder casts and other such casts on the lower extremities with which the patient is ambulatory, lightness has obvious advantages, it increases the mobility of the patient, involves less swelling and fatigue and imposes less burden on the vital circulation of the extremity involved

Several excellent brands of plaster of paris are now available on the general market, each varying in preparation, setting time and packaging After extensive use of many such products, it is our opinion that the Gypsona® bandage offers advantages in most situations requiring plaster immobilization The special non-fraying woven cloth is thoroughly and finely impregnated with highly refined and

dehydrated gypsum; a maximum of plaster is used in each bandage, and the bandages are limited to 3-yard lengths for easy wetting and quick application. Complete wetting is achieved in three to five seconds, with little loss of plaster in the immersion basin, more complete utilization of each bandage roll, reduction of the mess and less danger of damage to the sink drain. The cast sets in five minutes or less, depending on the water temperature and the mineral or crystal additives, and becomes a strong, light plaster with a brilliant creamy white finish, in contrast to the crumbly, off-white, less durable cast obtained with other types of so-called "fast-setting" plaster. The layers of special cloth are easily and quickly integrated one into the other by slight rubbing, which makes a firmer bandage and thereby uses less plaster. Actually, the end of the bandage is more difficult to find than with other types, because of its complete integration into the plaster. The end, therefore, should be carefully indicated with a marking pencil when removal of the cast at home by the patient is desired. Plastic inserts in the center of each bandage help to prevent telescoping of the bandage and aid in its smooth application. With a second immersion period of three to five seconds, there is no loss of time in application. The quick setting time facilitates retention of a difficult position with less danger of slipping. The finished product is smooth and whiter than regular plaster. It provides an ideal finish for marking and dating the cast, or even as a surface on which well-wishers may inscribe their greetings. An added quality of this plaster is that it permits bivalving and periodic removal; the edges which do not crumble, and the usual loose plaster particles are not present. In bivalving a freshly applied Gypsona® cast, however, caution must be exercised, as a sharp knife penetrates this plaster quite easily. Use of a protective felt strip 1 inch (2.5 cm.) wide under the line of splitting is a wise precaution unless the cast is heavily padded. Patients often state that this cast stays clean longer than others do, but this is probably due only to the much whiter original appearance.

In application of the Gypsona® bandage less plaster is used than ordinarily, because of its very firm consistency when set. The 3-yard roll bandages are a definite advantage in the application of extremity casts, discouraging a common tendency to use an excessive amount of plaster. This length, however, may be a disadvantage in the application of large casts, such as body jackets and hip spica casts, when a larger number of bandages must be used, and preferably 4-yard Gypsona® bandages should be employed. In such cases, reinforcement of the cast by ridging may be helpful. The center of a two-layer or three-layer splint should be gathered into a fine ridge and placed over a joint or other point of stress.

Plaster of paris has been unquestionably more helpful in correction of deformities, especially in children, than have the plaster substitutes. It is more malleable and quicker setting, and it lends itself to follow-up corrective wedging procedures more easily than do other materials. A quick-setting plaster that makes a firm cast is especially useful in the correction of pedal deformities in children, who find it difficult to retain a desired position for more than a few minutes. In addition, the light, brilliant white cast is more favorably accepted by the anxious parents concerned with the circulation and with the amount of added weight the small child must carry.

SUMMARY

In the constant search for a replacement or addition to the traditional plaster of paris for immobilization of the body and extremities, several new materials have

been developed by plastic chemists in the past two decades. Although each agent advanced offers distinctive properties and advantages, repeated use has demonstrated positive handicaps restricting it to special situations and rendering it undesirable for general use as a full replacement for plaster of paris.

When bathing of a part is especially desirable, as in hydrotherapy for a neuropsychiatric disorder in a patient with an intervening fracture, or when recreational bathing is urgently desired (fracture in an emotionally disturbed child at a summer camp) "Aire-Cast" is probably the agent of choice, since it is least likely to deteriorate from the constant wetting. All padding should be thoroughly treated to achieve some water repellence, and the patient should be advised to dry the cast well after each immersion. Such a cast can be applied only to nondisplaced fractures or when partial union has already been obtained with preliminary plaster immobilization. Casts impregnated with melamine resin are of some value for such purposes, but are less likely to remain intact than is the glass plastic material.

Plaster impregnated with melamine resin lends itself well to the treatment of small children or incontinent adults, in whom repeated soaking of a hip spica or a body cast by urine is apt to cause deterioration, cracking and constant unpleasant odors. "Melmac," which appears to be the most satisfactory product of this type now available, will add to the serviceable and efficient use of casts encircling the perineum. Because of its slightly delayed setting period it may be advisable to apply faster setting regular plaster or "Gypsona®" first, then apply "Melmac" or a similar product as an outer protective coat.

In view of their somewhat greater sensitivity, delayed setting time, increased cost, and increased time required of personnel for application and drying, the plaster substitutes should not be routinely employed but reserved for special situations. For general use, a rapidly setting, strong, light plaster of paris cast, as exemplified by the "Gypsona®" bandage, will serve as the best immobilizing agent in the hands of most surgeons. Despite the many recent advances made in the realm of plastics, time-honored plaster of paris, perhaps with added modern refinements, remains the most generally valuable material for immobilization of the body and extremities. It does not appear probable that it will be completely replaced.

RÉSUMÉ

Plusieurs dérivés de matières plastiques ont été proposés par l'industrie chimique au cours des deux dernières décades en vue de remplacer ou de compléter le traditionnel plâtre de Paris. Malgré certains avantages ils ne peuvent pourtant être utilisés que dans des cas particuliers, et leur emploi ne saurait être généralisé. Lorsque des bains partiels ou généraux sont indiqués (par exemple: hydrothérapie en neuropsychiatrie lors de fractures, etc.), le plâtre "air-caste" peut être recommandé comme étant celui qui offre la meilleure résistance à l'eau. Tous les bandages devraient alors être traités de façon à assurer un maximum d'imperméabilité (bien sécher le plâtre après immersion). Un tel plâtre ne peut être appliqué que dans les fractures sans déplacement ou après avoir obtenu une réduction partielle (immobilisation par un plâtre ordinaire préalable). Les plâtres imprégnés de résine ont une certaine valeur dans ces cas, mais ils sont moins résistants que le matériel plastique.

Le plâtre imprégné de résine peut être utilisé avec avantage chez les jeunes enfants et les adultes incontinents. Le produit de ce genre le plus satisfaisant semble être le "Melmac," en particulier pour les plâtres entourant le péritoine. En raison de son temps de durcissement légèrement

augmenté il peut être indiqué d'appliquer d'abord un plâtre ordinaire que l'on recouvrira d'une couche protectrice de "Melmac" ou d'un produit similaire.

En conclusion les substituts du plâtre devraient être réservés à des cas spéciaux. Ils sont plus délicats à manier et à poser, ils sèchent plus lentement. Nécessitant plus de temps de la part du personnel hospitalier ils sont aussi plus onéreux.

RIASSUNTO

Nell'incessante ricerca di materiali da sostituire o da aggiungere al gesso per la confezione di apparecchi di immobilizzazione del tronco e delle estremità, molte nuove sostanze sono state approntate dia chimici negli ultimi due decenni. Benchè, però, ciascuna di esse presenti reali vantaggi, il loro impiego continuato ha dimostrato che esse hanno anche degli inconvenienti che ne limitano l'uso a casi speciali e che le rende inutilizzabili nella maggioranza degli altri casi.

Quando si richieda, ad esempio, un bagno, come può avvenire in un paziente neuropsichiatrico che abbia anche una frattura, o quando si tratti di un ragazzo emotivo, allora è preferibile l'uso dell'Aire-Cast, che non si altera al contatto dell'acqua; l'imbottitura deve essere trattata con cura onde acquisti il potere di non assorbire acqua e il paziente deve asciugare per bene il gesso dopo ogni immersione. Tale apparecchio, però, deve essere applicato soltanto alle fratture senza spostamento o quando sia stata già ottenuta una parziale consolidazione. Per tali scopi sono anche utili i gessi imbevuti di resina melamina, ma sono meno resistenti di quelli di materia plastica. Essi si comportano bene se impiegati nei bambini piccoli o negli adulti con incontinenza urinaria, in cui l'impregnazione da parte della urina causa un logoramento dell'apparecchio o la sua rottura o un continuo odore sgradevole. Il prodotto migliore in questo campo, fra quelli che si possono trovare in commercio, è il "Melmac," ma poichè si consolida poco rapidamente è opportuno prima usare un gesso a presa normale rapida e quindi il melmac come strato esterno protettivo.

I sostituti del gesso, dunque, non devono essere usati d'abitudine, ma riservati per situazioni speciali, in vista della loro sensibilità, del loro ritardo di consolidamento, del loro costo e del più lungo tempo che richiedono per essere applicati e asciugati. Per gli usi correnti è meglio usare un buon gesso comune, a presa rapida, leggero e robusto come il "Gypsona®," che rimane ancora, a dispetto dei progressi compiuti nel campo delle sostanze plastiche, il materiale più utile per immobilizzare le fratture.

SUMARIO

Em uma procura constante para a substituição ou adição ao gessõ tradicional de "paris" para a imobilização do corpo e extremidades, quïmicos plásticos desenvolveram diversos materiais novos nas últimas duas décadas. Embora cada agente apresentado ofereça propiedades distintas e vantagens, o uso repetido demonstrou "handicaps" positivos que o restringem a situações especiais e o tornam indesejável para uso geral.

Quando se torna desejável banhar uma parte, como na hidroterapia de uma desordem neuropsiquiátrica em um paciente com fratura, ou quando o banho recreacional é urgentemente desejado (fratura em uma criança emocionalmente perturbada em um campo de verão), então o molde "Aire" é provàvelmente o agente de escolha, uma vez que é o que tem a menor probabilidade de se deteriorar com o umidecimento constante. Todo enchimento deveria ser tratado de maneira a conseguir certa repelência à agua, e o paciente deveria ser aconselhado a secar bem o molde após cada imersão. Esse molde só pode ser aplicado a fraturas sem deslocamento

ou quando jásse obteve união parcial com imobilização preliminar pelo gesso. Moldes impregnadas com resina melamina são de certo valor para tais propósitos, mas têm menos probabilidades de permanecerem intactos do que o material plástico de vidro.

O gesso impregnado com resina de melamina presta-se bem para o tratamento de criancinhas ou adultos incontinentes, nos quais o umidecimento repetido pela urina está apto para causar deterioramento, rachas ou constantes odores desagradáveis. Ŏ "Melmac" parece ser o produto mais satisfatório dêsse novo tipo agora viável, e será um acréscimo ao uso serviçal e eficiente de fôrmas em redor do peritôneo. Por causa de seu período de colocação ligeiramente retardado, pode se tornar aconselhável aplicar primeiro uma fôrma regular de colocação máis rápida ou a "Gypsona®" e depois colocar o "Melmac" ou um produto semelhante como um envólucro protector externo.

Em vista de sua sensibilidade relativamente maior, tempo retardado de colocação, custo maior, e mais tempo exigido para aplicação e secamento, os substitutos do gêsso não deveriam ser usados em rotina nas reservados para situações especiais. Para uso geral, um gêsso leve de "paris," forte, de colocação rápida, servirá como agente imobilizador ótimo na mão da maioria dos cirurgiões. A despeito dos inúmeros avanços recentes feitos no reino dos plásticos, o gêsso de "paris," talvez com o auxílio de refinamentos mais modernos, sendo o material mais valioso em geral para a imobilização do corpo e extremidades. Não parece provável que será completamente substituido.

ZUSAMMENFASSUNG

Die Kunststoffchemiker haben wahrend der Suche nach einem Ersatz oder einer Verbesserung des zur Stillegung des Korpers oder der Gliedmassen gebrauchlichen Gipsverbandes in den letzten zwei Jahrzehnten verschiedene neue Stoffe herausgebracht. Alle diese Materialien haben ihre bestimmten Eigenheiten und Vorzuge. Bei wiederholter Anwendung zeigt sich jedoch, dass ihnen auch deutliche Nachteile anhaften, die ihre Brauchbarkeit auf bestimmte Spezialgebiete beschranken und sie zum allgemeinen Ersatz des Gipsverbandes als ungeeignet erscheinen lassen.

Wo das Baden bestimmter Korperteile besonders erwunscht ist wie z B. bei neuropsychiatrischen Kranken, die hydrotherapeutische Behandlung brauchen und gleichzeitig einen Knochenbruch haben, oder wenn etwa im Falle eines emotionell gestorten Kindes mit einer Fraktur Schwimmen wahrend der Sommerferien als Erfrischung von grossem Wert erscheint, bildet wahrscheinlich der "Aire-Cast"-Verband das Mittel der Wahl, weil dieses Material am wenigsten durch standige Feuchtigkeit geschadigt wird. Das Polsterungsmaterial muss sorgfaltig vorbehandelt werdem, um einen gewissen Grad der Wasserabstossungsfahigkeit zu erlangen, und der Patient muss angewiesen werden, den Verband nach jeder Bewasserung sorgfaltig zu trocknen. Diese Art des Verbandes lasst sich nur bei Frakturen mit nicht verschobenen Bruchstucken oder in Fallen, wo durch vorangegangene Immobilisierung bereits eine partielle Heilung erfolgt ist, verwenden. Fur derartige Zwecke sind mit Melaminharz getrankte Verbande von gewissem Wert; der aus Glas hergestellte Kunststoff scheint jedoch dauerhafter zu sein.

Mit Melaminharz getrankte Verbande eignen sich gut zur Behandlung kleiner Kinder oder erwachsener Patienten mit Harninkontinenz, wo der Verband einer Hufte oder des ganzen Korpers der haufigen Benetzung mit Urin ausgesetzt ist und infolgedessen zerfallt, platzt und einen standigen unangenehmen Geruch entwikkelt. Das beste zurzeit

kat dieser Art scheint "Melmac" zu sein. Es ist leicht anwendbar und wirksam bei Verbänden um die Bauchhöhle herum. Da "Melmac" längere Zeit zum Trocknen braucht, mag es ratsam erscheinen, es als äussere Schutzhülle über einen schneller trocknenden "Gypsona®"-Verband anzuwenden.

Wegen der grösseren Empfindlichkeit dieser Verbandstoffe, ihrer längeren Trocknungszeit, höherer Kosten und ihrer grösseren Anforderungen an die Zeit des Personals zur Anlage und Trocknung des Verbandes empfiehlt es sich, sie für besondere Gelegenheiten aufzuheben, anstatt sie routinemässig zu verwenden. In den Händen der meisten Chirurgen ist für den täglichen Gebrauch ein schnell trocknender starker Gipsverband leichten Gewichts, wie er sich im "Gypsoma"-Verband darbietet, das beste Material zur Immobilisierung. Trotz aller Fortschritte der jüngeren Zeit auf dem Gebiete der Kunststoffe bleibt der altbewährte Gipsverband—vielleicht mit einigen modernen Verfeinerungen—noch immer das auf umfangreichem Gebiet wertvollste Mittel zur Ruhigstellung des Körpers und der Gliedmassen, und es sieht nicht so aus, als ob er völlig durch etwas Anderes ersetzbar wäre.

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Modern scholarship and modern science reproduce the same limitations as dominated the bygone Hellenistic epoch. and the bygone Scholastic epoch. They canalize thought and observation within predetermined limits, based upon inadequate metaphysical assumptions dogmatically assumed. The modern assumptions differ from older assumptions, not wholly for the better. They exclude from rationalistic thought more of the final values of existence. The intimate timidity of professional scholarship circumscribes reason by reducing its topics to triviality, for example, to bare sensa and to tautologies. It then frees itself from criticism by dogmatically handing over the remainder of experience to an animal faith or a religious mysticism, incapable of rationalization.

—*Whitehead*

Carcinoma in Otolaryngologic Practice: Statistics

JOSEPH G. SCHOOLMAN, M.D., F.A.C.S., D.A.B.
CHICAGO, ILLINOIS

THE expression of clinical experience in terms of numbers, equations and percentages is an attempt by the physician to translate medicine into a pure science. Though medicine is continually becoming more scientific, a large part of it remains art, judgment, intuition and inspiration. These qualities do not lend themselves to accurate assay and often confuse the presentation of facts.

At a meeting of the nation's largest society of otolaryngologists, members of a panel on carcinoma of the larynx indicated that the average duration of symptoms prior to diagnosis varies from eight to nine and one-half months. The institutions submitting these figures were geographically widely separated and handle a patient load with a relatively widespread economic status and possibly educational background. If these figures are accepted, it taxes one's credulity to accept the generally published 55 per cent rate of cure. At the institution I serve, confidence as to achieving a cure falls abruptly when symptoms have been present for over three and one-half months.

What does the 55 per cent "cure rate" represent? Is it 55 per cent of all patients whose condition is diagnosed as carcinoma of the larynx, or have those who have refused all therapy been culled from the total list?

Does it include those who were given no therapy because they were *in extremis* or beyond the curative scope of surgical skill; those who elected radiation therapy or were referred to the radiotherapist because surgical intervention was not feasible? If 55 per cent represents the cures achieved in cases selected for operation, it has no meaning with reference to carcinoma; it merely indicates the surgeon's ability to select a suitable case. If he were sufficiently selective he could have a rate of cure of 100 per cent, but the death rate would mount accordingly.

Even if all statistics were based on the total number of cases in which a diagnosis of carcinoma of the larynx has been made, the results would be more interesting than informative. For greater scientific value, the figures on carcinoma of the larynx would require further division into (1) supraglottic carcinoma, (2) chordal carcinoma and (3) subglottic carcinoma. The site of the lesion occasionally influences the histologic picture and frequently affects the clinical course, the type of therapy employed and the prognosis.

Histologic interpretation is also a factor in the distortion of statistics. Although in a large percentage of cases carcinoma is unmistakable, there is a borderline group of cytologic variations that are benign or malignant according to the subjective

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standards of the pathologist and the clinician. Examples of these are Bowen's disease, inverting papilloma, leukoplakia with metaplastic changes and that type of adenoma now recognized by some as acinic cell carcinoma.

Another factor that adds to the general confusion is the lack of agreement on classification. For example, lymphoepithelioma and undifferentiated cell carcinoma of the nasopharynx are considered epithelial tumors in the United States but are grouped with reticulum cell carcinomas by the Scandinavians. The manner in which a tumor is classified may materially alter the statistics when epidermal and mesodermal lesions are considered separately.

When one adds to all the foregoing considerations the fact that the person who presents the statistical material has a point to make, one must realize that, despite the best intentions and a strong effort to remain objective, he may still tend to interpret the data subjectively in order to support his argument.

What, then, is statistically acceptable in clinical practice? Certainly not the uncontrolled data amassed from the national and international literature. Perhaps, with reservations, one may accept the figures on progress in individual institutions where comparisons are limited to their own accomplishments as based on their own diagnostic and therapeutic standards. For example, in the past ten years at the University of Illinois our rate of cure expectancy of carcinoma of the maxillary sinus has risen from the generally published 32 per cent to about 51 per cent.

The improvement is due to several factors. Operations are more thoroughgoing than they formerly were. The Caldwell-Luc and Denker antrotomies have been discarded as inadequate in the definitive management of carcinoma; total or subtotal resection of the maxilla is now performed. In addition to encompassing more of the area, postoperative radiation therapy is almost invariably employed—whether teleradiation, contact radiation or interstitial radiation depends upon the indications in the individual case.

Perhaps the greatest factor in improving the results is the change of attitude. Participants in departmental tumor conferences consider the disease from the standpoint of total management rather than from the surgical aspect alone. From this more rational approach the training of the younger surgeons in the management of carcinoma has been augmented by the inclusion of radiation therapy. Whether or not they become radiotherapists is for them to decide, but they must be strongly aware of all the therapeutic possibilities if they are to function adequately. The splendid cooperation of the department of radiology in this plan has been most fortunate.

It has been said that "only one who can edit a book can read it intelligently." Those of us who are not editors and who do not know all the factors involved must be slow to accept at face value all statistics offered, regardless of the source.

SUMMARY

The author points out that the science of healing, medical or surgical, cannot be reduced to a so-called exact science by overuse of statistical data and exaggerated reliance upon the conclusions they suggest. There remain, and probably will always remain, large areas of both medicine and surgery in which the management of patients and the treatment of disease is far more an art than a science; sensibility, philosophy and human understanding are still urgently required.

The author therefore warns all practitioners of medicine and surgery that, although statistical surveys and the resulting tabulations of data have their place, they must not be allowed to supersede equally important, or more important, ele-

ments that enter into practice and professional judgment.

RÉSUMÉ

L'art de guérir, en médecine comme en chirurgie, ne peut être ramené à une prétendue science exacte par l'abus de données statistiques et par une confiance exagérée dans les conclusions qu'elles suggèrent. Il subsiste, et il subsistera sans doute toujours de vastes domaines médicaux et chirurgicaux où l'attitude à l'égard du malade et le traitement de la maladie sont bien plus un art qu'une science; la sensibilité, la philosophie et la compréhension de l'homme sont toujours une nécessité primordiale.

C'est pourquoi l'auteur met en garde *médecins et chirurgiens: si les statistiques* ont une valeur indéniable, il ne faut pourtant en aucun cas les substituer à d'autres éléments d'importance égale voire supérieure, et qui doivent entrer en ligne de compte dans tous les jugements du praticien.

SUMARIO

O autor chama a atenção para o fato de que a ciência de cicatrização, médica ou cirúrgica, não pode ser reduzida a uma tão chamada ciência exata pelo uso excessivo de dados estatíticos e dependência exagerada das conclusões que êstes sugerem. Existe e provàvelmente sempre existirá grandes áreas tanto da medicina como da cirurgia nas quais o manejo de pacientes e tratamento de moléstias é muito mais uma arte do que uma ciência; sensibilidade, filosofia e compreensão humana são *ainda urgentemente exigidos.*

O autor avisa portanto todos os que praticam *a medicina e a cirurgia que, embora* as pesquizas estatísticas e quadros de dados resultantes tenham seus lugares, não se deve permitir que êles anulem elementos igualmente importantes, ou mais importantes, que entram na prática e julgamento professional.

RIASSUNTO

L'autore ritiene che la scienza del guarire, medica o chirurgica che sia, non può essere considerata una scienza esatta e non deve diventarlo con l'abuso delle statistiche. Rimangono ancora, e forse rimarranno sempre, dei vasti campi della medicina e della chirurgia in cui la cura dei malati e delle malattie è più un'arte che *una scienza e richiede senhibilità, filosofia* e comprensione umana.

L'autore *mette in guardia*, pertanto, tutti coloro che si dedicano alla medicina dall'attribuire alle statistiche maggior importanza di quella che ad esse non competa e a non considerarle al di sopra della pratica e del giudizio professionale.

ZUSAMMENFASSUNG

Der Verfasser warnt vor der Gefahr, die Wissenschaft medizinischen oder chirurgischen Heilens durch übermässige Anwendung statistischer Daten und durch übertriebenes Vertrauen in die aus ihnen gewonnenen Schlussfolgerungen auf eine sogenannte exakte Wissenschaft einzuengen. Sowohl in der Medizin als in der Chirurgie gibt es noch immer und wird *es wahrscheinlich auch in der Zukunft* grosse Gebiete geben, auf denen die Behandlung der Kranken und der Krankheit weit mehr eine Kunst als eine Wissenschaft ist; Empfindungsvermögen, philosophische Haltung und menschliches Verständnis sind noch immer dringend erforderlich.

Der Verfasser rät daher allen, die Medizin und Chirurgie ausüben, sich nicht dazu verleiten zu lassen, durch statistische Beobachtungen und Tabellierungen, auch wenn diese ihren angemessenen Wert haben, wichtige Elemente ärztlicher Praxis und beruflicher Urteilskraft zu ersetzen,

Sinusitis: Radical Surgical Treatment

FRED HARBERT, M.D., F.A.C.S., F.I.C.S., D.A.B.*

PHILADELPHIA, PENNSYLVANIA

JEFFERSON once stated that that government is best which governs least. In my opinion the same applies to surgery; i.e., that operation is best which least interferes with physiology and function.

For the antrum, I usually prefer a window type of operation and reserve the Caldwell-Luc procedure almost exclusively for foreign bodies, such as teeth, or the removal of cysts or polyps demonstrable by roentgen ray and lipiodol. I have practically abandoned operations on the ethmoid sinuses *per se*. When there are mucous polyps, I attempt to remove only a few at a time and permit healing to occur before removing more. This is done as an office procedure; no attempt is made to perform an elaborate and extensive removal at one sitting—a policy based on the prevention of massive scarring and resultant nasal dryness and crusting.

I have also found it practically unnecessary to operate on the sphenoid sinus. In general, soft tissue lesions such as edema and hyperplasia are reversible, and I do not advocate surgical intervention simply because of roentgen or clinical evidence of hyperplastic change.

Operation is usually indicated when there are extensive bony changes in the sinuses. These changes may be of two types. In the proliferative variety, which is the type most commonly associated with chronic sinusitis, there is condensing osteitis that tends to encroach upon and obliterate the lumen of the sinus. In some instances this becomes so extreme as to warrant the term "obliterative sinusitis." The second type of change is osteolytic. Osteolytic types include osteoporosis, or demineralization, and osteomyelitis. The latter is caused by infection of the cancellous bone and is characterized by the formation of sequestra. The acute fulminating type was once treated heroically by removal of all infected and potentially infected bone. With modern antibiotics available, I do not consider this radical exenteration justified. Antibiotics can limit the spread to new areas and change acute osteomyelitis into a localized chronic type of the disease, which can be treated by incision, drainage and removal of sequestra. When the lining of a sinus is stripped, there is regeneration of mucosa from the region of the duct and from areas of mucosa that have inadvertently been left. While this mucous membrane is growing into the sinus, proliferative changes of bone are also taking place. When the sinus is healed it will be much smaller than it was originally. If epithelium has been left, this may become incorporated in the bony and fibroblastic reaction and form mucoceles or pyoceles. I do not now remove all mucous membrane. Polyps and granulomas are removed, and cysts are saucerized. Edematous and thickened mucous membrane is left intact.

Spontaneous perforation of the anterior frontal plate does not necessarily mean the need for an obliterative type of operation, such as that advocated by Killian or Reidell. Drainage of the floor in such cases is quite successful. In cases in which there is injury of the frontal sinus, correction can be achieved by the use of

*Professor of Otolaryngology, Jefferson Medical College, Philadelphia.

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bone grafts (cancellous bone from the ilium), diced cartilage, dermal grafts, acrylic plates or tantalum plates. It is impossible to insert grafts beneath thin atrophic scars. If these are present, suitable covering in the form of pedicle grafts must first be provided. I have used both cancellous bone grafts and diced cartilage to correct relatively small irregular defects, with success. For larger defects I prefer a plate, such as the tantalum plate.

It has been customary to employ intranasal procedures, such as submucous resection, infraction of the middle turbinate and removal of polyps, as prophylactic measures to prevent the recurrence of acute infection. It is my impression that none of these measures meets with much success because the main pathologic condition is in the nasofrontal duct, and this is not affected by the aforementioned procedures. There is certainly no objection to removing obstructive polyps or doing a submucous resection when a patient requires it for nasal respiration. That a narrowed nasal passage in the vicinity of the middle turbinate is a factor in frontal sinusitis can easily be disproved by the fact that as many or more instances of frontal sinusitis occur on the side where the nasal passageway is greatest, in cases of deviation of the nasal septum. Infraction of the middle turbinate will not affect the nasofrontal connection in any way. Any pus that is delivered beneath the middle turbinate will find its way out of the nose. It is the passage above this level that becomes obstructed in the presence of either acute or chronic sinusitis.

There are many operations for chronic frontal sinusitis. Intranasal procedures include rasping in the Halle type of intranasal ethmoidectomy and frontal sinusotomy. The classic type of external frontal sinus operation first described by Jansen and variously modified by Lynch, Sewall, Ferris, Smith, Luongo and others combines an external ethmoidectomy with removal of the floor of the frontal sinus. Throughout the years there has been a tendency to change from simpler to more extensive procedures. It is pointed out, however, that cure is often not obtained by even the most extensive fronto-ethmosphenoidectomy, because of excessive scarring and prolapse of periorbital tissue. With the more extensive procedures the morbidity rate—and often the mortality rate—is increased. In order to insure patency of the nasofrontal connection, I recommend first that the posterior superior nasal spine and adjacent tissue be not disturbed and that the opening into the sinus be made through the underlying ethmoid cells. Second, the maintenance of an intact bony wall on all sides of the frontoethmoid region, as advocated by Lathrop many years ago, will prevent subsequent cicatricial contraction. We are all aware of the ease with which a tracheotomy opening closes as soon as the cannula is removed, even though it has been in place for many weeks and is apparently completely epithelized. This is true of all soft tissue sinuses. If a bony ring is left, however, this collapse is not possible. The third important criterion is epithelization of the new nasofrontal connection. This is produced by inserting a 1 cm. tube covered with a full thickness graft of mucous membrane obtained from inside the cheek. The graft is sewed in place with the raw side outside. The donor site in the cheek is closed completely in a linear manner, and when healing is complete the scar can seldom be noticed. Skin grafts have been advocated for similar use, but I should like to warn against this procedure. Whenever mucous membrane and skin are mixed the skin becomes macerated and produces a foul, wet mess. I have seen this occur repeatedly in the orbit.

SUMMARY

The author presents his opinion as to the indications for radical operation on the

sinuses, stating that he has practically abandoned operations on the ethmoid and sphenoid sinuses *per se*. Removal of mucous polyps is done in successive stages as an office procedure. Soft tissue lesions such as edema and hyperplasia are reversible, and he does not consider operation justified merely because of clinical or roentgen evidence of hyperplastic change.

Various operations employed for treatment of the sinuses are mentioned, with the circumstances in which they can be used to advantage. In general, however, the author's attitude may be summed up in the statement that the best operation is the one that interferes least with the physiologic and functional status of the parts of the body operated on, which emphatically includes the sinuses.

RÉSUMÉ

L'auteur expose ses opinions quant aux indications chiurgicales radicales des interventions sur les sinus; il a pratiquement renoncé à opérer les sinus ethmoidaux et sphénoidaux *per se*. Il pratique l'ablation des polypes muqueux en plusieurs temps ambulatoirement, à son cabinet. Les lésions des parties molles telles que l'oedème et l'hyperplasie sont réversibles, et il ne considère pas l'opération comme justifiée du seul fait de l'évidence clinique ou radiologique d'une modification hyperplasique.

Diverses méthodes opératoires sont mentionnées, ainsi que les cas dans lesquels elles peuvent être utilisées avec profit. Mais d'une façon générale l'attitude de l'auteur peut se résumer ainsi: la meilleure opération — et cela est particulièrement valable pour les sinus—est toujours celle qui ménage au maximum l'intégrité physiologique et fonctionnelle.

SUMARIO

O autor dá sua opinião quanto às indicações para as operações radicais nos sinus, declarando que pràticamente abandonou as operações nos sinuses etmoideo e esfenoideo pròpriamente ditos. A remoção dos polipos mucosos é feita em estágios sucessivos como operação de consultório. Lesões de tecido mole tais como edema a hiperplasia são reversíveis e êle não considera a operação justificada apenas pela evidência clínica ou roentgenográfica da alteração hiplástica.

Várias operações usados no tratamento dos sinuses são mencionadas, com as ocasiões nas quais podem ser usadas com vantagem. Em geral, entretanto, a atitude do autor pode ser resumida na declaração de que a melhor operação é a que menos interfere com a parte funcional e fisiológica do corpo operado, o que enfàticamente inclui os sinuses.

RIASSUNTO

L'autore espone la sua opinione sulla cura radicale delle sinusiti, affermando di aver abbandonato completamente gli interventi sull'etmoide e sullo sfenoide *per sè*. I polipi mucosi vengono asportati in vari tempi; le lesioni delle parti molli, come l'edema e l'iperplasia, sono reversibili, e non vi è giustificazione all'intervento quando vi siano aspetti clinici o radiologici che facciano pensare soltanto a modificazioni ipertrofiche.

Vengono elencati i vari tipi di interventi chirurgici usati nella cura dei seni e le loro rispettive indicazioni. In generale, tuttavia, la tendenza dell'autore è di considerare buon intervento quello che meno interferisce con le funzioni della regione in cui si opera; e questo vale anche per i seni.

ZUSAMMENFASSUNG

Der Verfasser gibt eine Darstellung seiner Beurteilung der Indikationen zur radikalen Operation der Nasennebenhöhlen und berichtet, dass er die Operation der Siebbeinzellen und der Keilbeinhöhle

per se praktisch aufgegeben hat. Schleimhautpolypen werden in aufeinanderfolgenden Sitzungen in der Sprechstunde entfernt. Gewisse Weichteilveranderungen wie Ödem und Hyperplasie sind ruckbildungsfahig, und der Verfasser halt einen operativen Eingriff nicht fur gerechtfertigt, nur weil klinische oder rontgenologische Anzeichen hyperplastischer Veranderungen vorliegen.

Es werden verschiedene zur Behandlung der Nebenhohlen angewandte Operationen und die Bedingungen, unter denen sie sich mit Nutzen ausfuhren lassen, erwahnt. Im allgemeinen aber lasst sich der Standpunkt des Verfassers dahin zusammenfassen, dass die beste Operation die ist, die am wenigsten die physiologischen und funktionellen Aufgaben des Korpers, und die Nebenhohlen der Nase sind dabei selbstverstandlich nicht ausgeschlossen, beeintrachtigt.

The working programme of a surgeon shows how much energy could be taken out of the human organism. The Mayo brothers were generally in their operating theatre by 7:30, and Harvey Cushing after breakfast at 8:00, was driven over to the hospital. While the chauffeur drove on to school with the Cushing children, their father was in his hospital office, attending to correspondence. He remained thus for about two hours occasionally eating buttered toast, and was ready to commence his operations by about eleven o'clock.

There followed lengthy, meticulous and laborious hours. Few people who picture the glamorous lives of great surgeons could face the strain of sitting in a darkened and moist room, working with deft touches of fingers at the bottom of a cavity a few inches across, patiently arresting the blood from tiny arteries, handling everything with prodigious delicacy, never hurrying, hardly ever relaxing, each faculty strained upon that narrow field which is the interior of a human skull brightly illuminated from an electric lamp fastened to the operator's forehead. For three or four hours this must go on, silently, with every moment deliberately keyed down so as to be quite undramatic; yet behind it is the human life at stake, and in consequence the emotions of the operator can never run cold. He must give of himself all the time, never allow his attention to wander, must keep a look-out for all possible danger signs, while the team of six or eight assistants who are in the theatre have to be directed by his responsible brain.

—*Williams*

Plastic and Reconstructive Surgery

Recent Trends in Surgical Treatment of the Cleft Palate

G. KENNETH LEWIS, M.D., F.A.C.S., D.A.B.*

CHICAGO, ILLINOIS

IN the surgical repair of alveolar and postalveolar clefts of the palate, the goal is separation of the oronasal cavities, improvement of respiration, deglutition, oronasal hygiene and provision of a mechanism for normal speech. At the same time, of course, the aim is for good anatomic relations.

The first operations for correction of these abnormalities were performed very late in the eighteenth and the early part of the nineteenth century. The vast literature on the subject of surgical correction of cleft palate is evidence that many of the problems connected therewith have not yet been solved. This is not surprising when one realizes the infinite variations in type and the multiplicity of factors involved.

An objective of operative treatment is complete closure of the cleft, if possible, but more particularly the provision of a mechanism by which the nose can be shut off from the mouth. Regardless of a perfect anatomic result, no operation for closure of the cleft that fails in this, and does not prevent leakage of air into the nose during phonation, can be called a success. As yet, however, no procedure has been devised that will always assure this result.

Another primary objective of closure is the formation of a velopharyngeal sphincter. If this cannot be accomplished by the operative procedure, the validity of the operation is questionable.

Some surgeons in the past exhibited completely closed defects, expending much time and ingenuity on ways and means of achieving such results. Today, if the patient can snort and carry out blowing tests that indicate efficient control of the oronasal sphincter, the operation, in my opinion, has accomplished its purpose.

In early operative procedures defective speech was only slightly improved, from operations that shifted the tissues to the midline, with subsequent scar contraction, to a palate already short. Examples of this were operations devised by Dieffenbach[1] and von Langenbeck,[2] who employed the use of advancement flaps of mucoperiosteum for repairing clefts of both the hard and the soft palate. Davies-Colley[3] suggested an epithelial lining for the flaps of the palate. The use of osteoplastic flaps was suggested by Wutzer.[4] Closure of the alveolus by forcible compression of the bones was recommended by Brophy.[5] These and other procedures succeeded in securing anatomic closure and some improvement in deglutition, respiration and

From the Department of Otolaryngology, University of Illinois College of Medicine, Chicago.

*Clinical Associate Professor of Otolaryngology, University of Illinois College of Medicine; Attending Plastic Surgeon, Cook County Hospital; Consulting Plastic Surgeon, Illinois Central Railroad, Chicago; Surgical Consultant, United States Fifth Army.

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oral hygiene, but they did little to improve speech inadequacies.

The chief reason for closing the palate is to make good speech possible, but if the soft palate is not long enough or sufficiently mobile to prevent the passage of air to the nose, the achievement of good speech is improbable. Since its inception, palatal surgical intervention has been constantly directed toward overcoming this failure. Numerous procedures have been employed to lengthen the palate, on the theory that a defect of speech in the patient with cleft palate is caused by the anteroposterior shortness of the palate or by increased pharyngeal dimensions.

Methods were devised to lengthen the palate in its anteroposterior dimensions; to bring forward the postpharyngeal wall, and to reduce the circumference of the pharynx. It was hoped that better closing of the pharynx would result in better speech. Technics were also devised by Schoenborn,[6] Blasius,[7] Meyer,[8] Blair and Ivy[9] and others, to lengthen the palate by adding tissue in the form of flaps from the pillars of the tonsils, the cheek and the posterior pharyngeal wall, and by the use of extraoral tissues.

Another method was the use of a pharyngeal flap taken from the postpharyngeal wall and attached to the posterior surface of the velum. The primary intention of this was to lengthen a short palate, to close off the nasopharynx during phonation and to close wide clefts previously operated on. A difficulty in this procedure was the smallness of the area in which operation had to be performed. It was found, however, that this could be overcome by doing a preliminary tracheotomy.

Other procedures were advocated by Veau,[10] Axhausen,[11] Brophy[12] and others. All, however, had one common defect: the palate was too short for the desired result: functionless tissue interfered with mobility of the palate, and speech was not improved. Hence, more radical procedures were devised.

In an effort to correct the disappointing results of using extrapalatal tissues for lengthening, Dorrance[13] designed and popularized the "pushback operation" for posterior displacement of the entire palate. This was based upon the principle of the delayed flap developed by Blair[14] and later modified by Browne,[15] who preserved the palatine arteries in posterior displacement.

Other schools of thought advocated bringing the postpharyngeal wall forward to meet the shortened palate, by such means as the introduction of paraffin into the submucosa of the posterior pharynx,[16] the introduction of fat, fascia and cartilage grafts,[17] and reefing of the mucous membrane of the pharynx itself.[18] Today these procedures are rarely used, if at all.

Various forms of pharyngoplasty were advocated for reduction of the circumference of the pharynx, such as excision of elliptic sections[19] and reduction of electrocoagulation.[20] Wardill[21] performed an operation designed for the posterior and lateral walls of the pharynx. This procedure was an attempt to decrease the width of the pharynx laterally and increase the bulk of Passavant's cushion on the posterior pharyngeal wall. These operations for a complete cleft failed to accomplish their purpose, increased the risk and entailed additional operations.

No description of specific operative technics currently employed will be included here, since, although there were innate defects in some of the older methods, such as those of Dieffenbach and von Langenbeck, some of the salient principles of their operations have stood the test of time as standard procedures. Advances in surgical treatment of the palate have consisted largely in improvement and modifications of these technics, aimed toward better anatomic results and, indirectly but significantly, the achievement of improved speech. [illegible] within recent years,

surgical technics for the treatment of cleft palate have been improved to such an extent that they are now fairly well standardized.

Optimum Time for Operation. — The question of when to close the palate has been somewhat controversial. The more consistent recent trend, however, has been to close the cleft when the patient is approximately 18 months to 2 years old. At the turn of the present century the palate was closed after the child had learned to talk. This practice was based upon the theory that a relatively large amount of tissue was present in proportion to the cleft, that the alveolus had closed to some extent and that the arch of the palate was relatively high.

This idea was later discarded in favor of the theory that habits formed by the tongue were abnormal in the unclosed cleft, producing speech that was imperfect and uncorrectable when the palate was closed at a later date. Many authors, including Lane[22] and Brophy[23] considered that the earlier the palate was closed the better the function that could be obtained, therefore, Lane closed the palate as soon after birth as the infant could tolerate an operation.

According to Slaughter and Brodie,[24] this was based upon the desire to separate the nasal and oral cavities so as to favor the development of normal breathing habits; to prevent the return of food through the nose; to facilitate feeding; to establish normal physiologic aeration of the nose to assure development; to minimize middle ear infection, and to improve the appearance of the face. Although some of these objectives were attained, Slaughter and Brodie pointed out the number of poor cosmetic and functional results of this therapy at puberty.

During the past decade, attention has been called to the growth of the child's head and face from the time of birth. Interest has been directed toward the serious deformities resulting from surgical intervention and the consequent disturbance of bony growth. After initial closure of the palate shortly after birth, many children had to undergo additional operations to keep the closure intact. Likewise, as the child matured, there were speech defects, as well as oronasal, pharyngeal, and other disturbances. Slaughter and Brodie were able to demonstrate that operation can and does inhibit normal growth, and that this disturbance is directly proportionate to the amount of injury and diminution of the blood supply to the parts concerned. These authors emphasized the fact that palatal operations, poorly timed and poorly done, eventually do more harm than good.

Makuen[25] expressed the opinion that speech impressions and habits are developed early in the second year and that the most serious imperfections of speech are acquired in the formative period.

Veau advocated closure of the palate between the ages of 10 and 20 months. His reported mortality rate for closures in the first year was 9 per cent, with normal speech in 70 per cent of cases. For closures in the second year the mortality rate was 5 to 6 per cent, with normal speech in 69 per cent of cases. In the third year there was no mortality, and normal speech was obtained in 25 per cent of cases.

As a rule I have followed the plan of closure of the palate between the ages of 14 and 18 months, provided the general health of the child is within normal limits. Exceptions are made with partial clefts, which I close earlier, and bilateral clefts, which I close later. The hard and soft palates are usually closed in one operation. Widely separated clefts, however, which require two or more operative procedures, are done when the child is more than 18 months old.

Prosthesis versus Operation.—Reparative and reconstructive work on the palate must be considered from the functional, esthetic and psychologic points of view.

It is often advisable to use a prosthesis as a substitute for operation, not as an adjunct to it. The question will arise whether the palate should be repaired by operation or by artificial means. There are a number of factors that influence this decision: 1. The condition of the child may be such that operation is inadvisable. 2. With regard to adult patients, some cannot afford the time and money for hospitalization and operation and decide instead on a mechanical speech appliance. 3. Some surgeons will decide on a mechanical separation of the oronasal cavity rather than an operative procedure. Most patients, however, or parents of young patients, are better satisfied with a palatal operation, in spite of the fact that the esthetic results of a prosthesis may be better. The psychic effects of surgical repair are much superior to the state of mind induced by a prosthesis, because of the problem of replacement and repair of the prosthetic appliance and the renewals necessitated by the alterations of growth.

Tissue that is scarred and contracted does not make a good base upon which to place a prosthesis. Edematous tissue is a contraindication for making the necessary casts. Proper construction of a prosthesis, therefore, requires the close cooperation of the prosthodontist (who constructs the prosthesis) and the surgeon.

Speech and Rehabilitation.—Today it is recognized that considerations other than surgical enter into the problem of rehabilitation of the patient with a cleft palate, who may well be termed a "cripple." After the palate is closed, care of the child does not stop, because normal speech and psychic rehabilitation are essential objectives of closure.

Veau estimated that, after operation, normal speech occurs in 27.8 per cent of patients and improved speech in 47 per cent. These poor results cannot be attributed entirely to operative reconstruction of the palate. The intellect and determination of the patient are often the decisive and contributing factors in good phonation, for good enunciation may be observed after an ineffectual repair and, at times, poor phonation with an excellently repaired palate. Poor phonation in a well-repaired palate indicates a cranial disturbance or a cerebral change over which the surgeon has little, if any, control.

A very high percentage of patients with cleft palate, even with the best possible surgical closure, require orthodontia and speech training. Many patients with repaired palates, even without speech training, will achieve excellent speech. On the other hand, many show poor anatomic and functional results from the standpoint of speech, even with extensive speech training. It is in the latter group that proper pretherapeutic evaluation might avoid results embarrassing to the patient and the surgeon and prevent difficulties with other forms of treatment.

Although a successful velopharyngeal closure has been accomplished, the child, by the time closure is performed, may have acquired some habits that require reeducation to overcome. For older patients the outlook for normal speech after the operation is less promising than for those below the age at which speech begins. Repair after speech has developed requires that the patient overcome wrong methods of breathing, as well as faulty habits and speech patterns.

Statistics on the high incidence of cleft palate pose an important problem. Because of numerous factors involved in rehabilitation, however, other than surgical correction and functional restoration, cleft palate clinics are being established in various parts of the United States and staffed by representatives of the various specialties interested in the patient with this problem. These teams are made up of the surgeon, the dentist and orthodontist, the prosthodontist, the otolaryngologist, the pediatrician, the speech therapist, the psy-

chologist and the social worker. Many co-workers, such as the histologist, the pathologist, the anatomist, the embryologist, and the geneticist, are also called in for help and consultation. Each patient is seen by the entire group after the initial closure of the lip, which, in most instances, has been performed as early in life as practical. By means of this consultation among an interprofessional group, a cooperative system of planning for the treatment and rehabilitation of each child is arrived at, and therapy is prescribed which is best suited to the solution of the individual problem.

SUMMARY AND CONCLUSIONS

Trends and progress in the surgical treatment of cleft palate from its inception are presented. The failures and shortcomings of some of the earlier methods of operation and the satisfactory elements of certain others are discussed, with reasons for their end results.

It is pointed out that some of the salient principles of some well known operative procedures of the past, with modifications and improvements, are currently still used in operations for cleft palate surgery, which today are fairly well standardized.

Nevertheless, the future development and further improvement of the surgical treatment of this condition is dependent upon an agreement upon the fundamental principles of repair of this deformity. Much research and study is now being done, and much will be required, to achieve the goal of perfect anatomic, functional and cosmetic closure, with good speech.

An important step in this direction has been the recent establishment of cleft palate clinics, staffed with representatives of the various specialties. This interprofessional cooperation greatly enhances the pretreatment evaluation of the prognosis and the efficiency programs for therapy and speech training.

RÉSUMÉ ET CONCLUSIONS

Les tendances et les progrès du traitement chirurgical de la fissure du palais sont passés en revue. Les échecs et les mauvais résultats de quelques méthodes opératoires, les résultats satisfaisants de certaines autres sont discutés.

Quelques-uns des principes essentiels d'anciennes techniques modifiées et améliorées sont encore en usage. Le traitement chirurgical des fissures du palais est aujourd'hui assez unifié. Mais des progrès ne pourront être accomplis que par une entente sur les principes fondamentaux des modes de traitement de cette malformation. De nombreuses études seront encore nécessaires avant d'obtenir des résultats anatomiques, fonctionnels et cosmétiques parfaits avec une bonne phonation.

Une innovation heureuse est l'établissement de cliniques spécialisées où travaillent des spécialistes divers. Cette collaboration interprofessionnelle augmente la valeur du traitement pré-opératoire, elle permet un meilleur pronostic et une plus grande efficacité des programmes thérapeutiques et de rééducation de la parole.

CONCLUSIONI RIASSUNTIVE

Vengono tratteggiati i progressi e le tendenze nella cura della palatoschisi, gli insuccessi di alcuni metodi antichi e i successi di altri metodi, e le ragioni dei risultati.

Alcuni dei principi basilari di certi metodi antichi sono ancora comunemente applicati oggi giorno con opportune correzioni e modifiche; tuttavia lo sviluppo futuro e gli ulteriori perfezionamenti di questa chirurgia dipendoo da alcuni principi fondamentali. Studi e ricerche sono tuttora in atto allo scopo di distabilire quale sia il metodo che consente una chiusura anatomica perfetta e un perfetto risultato estetico e funzionale.

Un passo importante in questo senso si e fatto con la creazione di reparti specializzati per la cura della palatoschisi, in cui lavorano rappresentanti di ogni specialita Questa collaborazione e molto valida nella valutazione preoperatoria, nella scelta del programma di cura e nella rieducazione del linguaggio

SUMARIO E CONCLUSOES

Tecnicas e progressos no tratamento cirurgico da fissura palatina são apresentados Os fracassos e detalhes de alguns dos primeiros metodes e os elementos satisfatorios de certos outros, são discutidos, com razões para os seus resultados finais

Salienta-se que alguns dos principios salientes de alguns metodos operatorios bem conhecidos do passado, com modificações e melhoramentos, são ainda correntemente usados nas operaçãoes para a cirurgia da fissura palatina, que estão hoje em dia bastante padronizadas

Entretanto, o futuro desenvolvimento e melhoramento posterior do tratamento cirurgico dessa condição depende do concordância sôbre os principios fundamentais do reparo desta deformidade Muita pesquiza e estudo estão sendo feitos hoje em dia, e muito ainda se precisara fazer para se alcançar o "goal" de perfeito fechamento anatômico, funcional e cosmético, com boa fala

Um passo importante nessa direção foi o estabelecimento decente de clinicas de fissuras palatinas, equipadas com representantes das varias especialidades Esta colaboração interprofissional permite grandemente a avaliação do prognóstico antes do tratamento e a eficiência de programas para a terapia e treino da fala

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Es werden die Tendenzen und Fortschritte in der chirurgischen Behandlung des Wolfsrachens seit ihren Anfangen dargestellt Die Versager und Nachteile mancher alterer Operationen, die befriedigenden Grundlagen anderer Operationen und die Grunde fur die Endergebnisse werden erortert

Es wird darauf hingewiesen, dass einige der wichtigsten Grundsatze manchen wohl bekannter Operationsverfahren der Vergangenheit noch heute mit gewissen Abanderungen und Verbesserungen in der chirurgischen Behandlung des Wolfsrachens, die zurzeit ziemlich gut standardisiert ist, Verwendung finden

Nichtsdestoweniger hangt die kunftige Entwicklung und weitere Verbesserung der chirurgischen Behandlung dieser Erkrankung davon ab, dass man sich uber die fundamentalen Grundsatze der Reparatur dieser Missbildung einigt Auf dem Gebiete der Forschung wird augenblicklich viel getan, und mehr noch wird getan werden mussen, um das Ziel einer Schliessung der Spaltbildung mit fehlerlosen anatomischen, funktionellen und kosmetischen Ergebnissen und mit guter Sprechfahigkeit zu erreichen

Einen wichtigen Schritt in dieser Richtung bildet die kurzliche Eroffnung von Wolfsrachenkliniken, deren Stab sich aus Vertretern verschiedener Spezialitaten zusammensetzt Eine solche interprofessionelle Zusammenarbeit erhoht den Wert der Prognose vor der Behandlung sehr erheblich und verstarkt die Wirksamkeit der Plane zur Behandlung und Sprachbildung

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It is the first step in sociological wisdom, to recognize that the major advances in civilization are processes which all but wreck the societies in which they occur:—like unto an arrow in the hand of a child. The art of free society consists first in the maintenance of the symbolic code; and secondly in fearlessness of revision, to secure that the code serves those purposes which satisfy an enlightened reason. Those societies which cannot combine reverence to their symbols with freedom of revision, must ultimately decay either from anarchy, or from the slow atrophy of a life stifled by useless shadows.

—Whitehead

Megacolon: Treatment By Rectosigmoidectomy

Report of Two Hundred Consecutive Cases

DAHER E CUTAIT, M D , F I C S *

SAO PAULO, BRAZIL

RECTOSIGMOIDECTOMY is at present considered the best operative method for the treatment of megacolon Statistics of experienced authors show that the operations commonly performed until some years ago, such as sigmoidectomy, sympathectomy and pelvirectal or internal anal sphincterectomy, did not yield satisfactory results, considering the large number of patients not benefited and the numerous recurrences following such operations

Statistics concerned with treatment by rectosigmoidectomy, on the contrary, show cure of the disease in almost all patients This obviously accounts for the current preference for this surgical procedure by surgeons of the main medical centers all over the world

This paper is concerned with the experience obtained from 200 cases of acquired megacolon treated by this operative method at the 3a Clinica Cirurgica do Hospital das Clinicas da Faculdade de Medicina da Universidade de São Paulo (Profs B Montenegro and Alipio Corrêa Netto) from May 1947 to April 1956 Sixty-eight patients were subjected to abdominal rectosigmoidectomy and 132 to abdominoperineal rectosigmoidectomy One hundred and twenty-six were male and 74 were female The age distribution was as follows

Age, Years	*No of Cases*	*Percentage*
11 20	5	2 5
21 30	57	28 5
31 40	68	34
41 50	48	24
51 60	17	8 5
61 70	4	2
71 80	1	0 5
Total	200	100

Pathogenic Basis —Abdominal rectosigmoidectomy was first performed on the pathogenic basis of achalasia of the pelvirectal sphincter According to this theory, *dilatation of the sigmoid colon would result from an obstacle caused by lack of relaxation of the sphincter at the moment of evacuation of the bowels, as a consequence of inflammatory lesions of Auerbach's mienteric plexus* Resection of the rectosigmoid segment as well as of the dilated sigmoid, followed by a low rectocolic anastomosis, should, as was pointed out by Corrêa Netto,[1] cure the patients

Abdominoperineal rectosigmoidectomy was performed on the pathogenic basis of dyskinesia of the distal portion of the intestine According to this pathogenic theory, dilatation of the sigmoid colon *would result from lack of propulsive ca-*

From the Department of Surgery (Profs B Montenegro and Alipio Correa Netto) Medical School of the University of Sao Paulo

*Head of the group in charge of diseases of colon rectum and anus assistant to Prof B Montenegro

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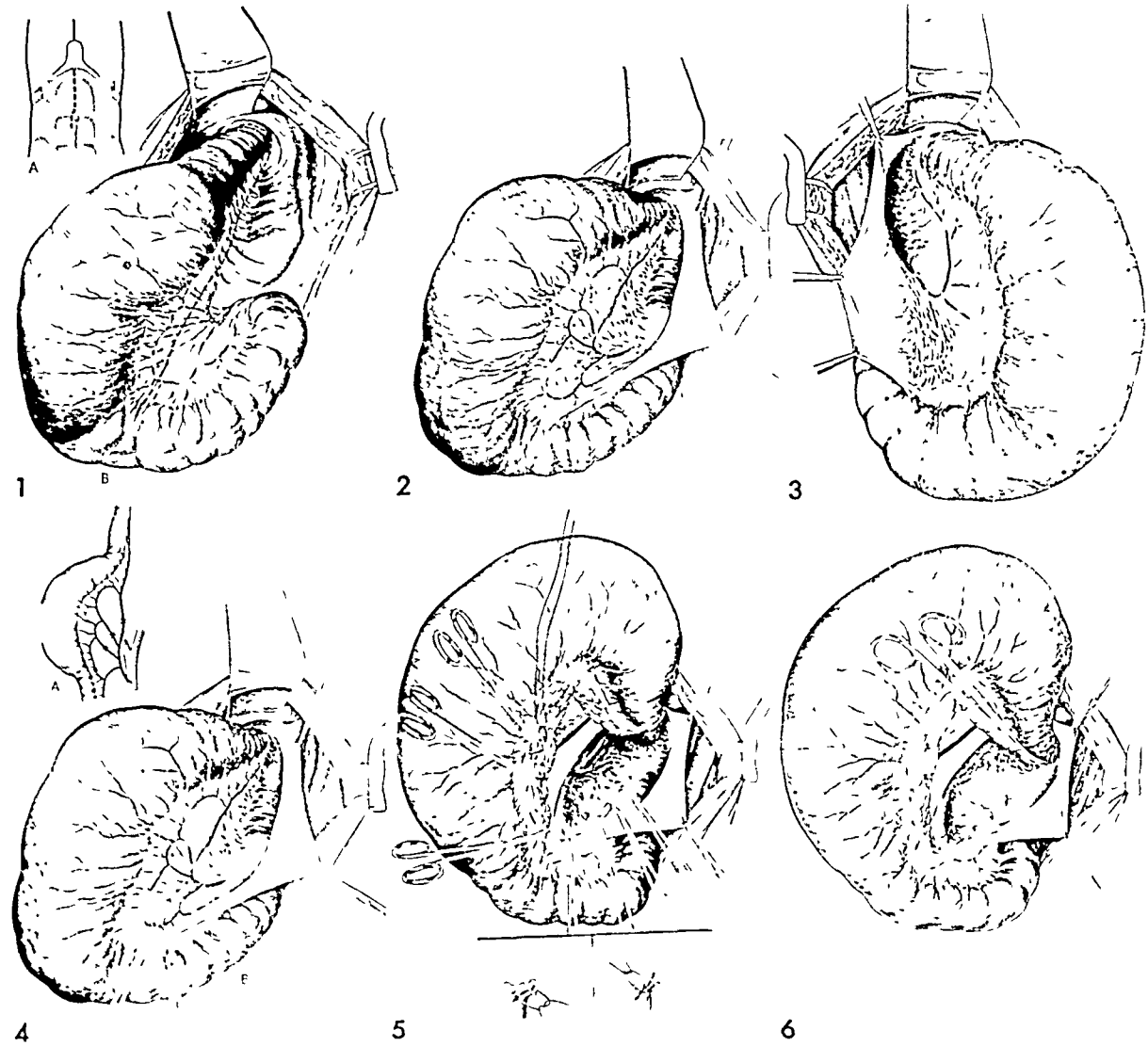
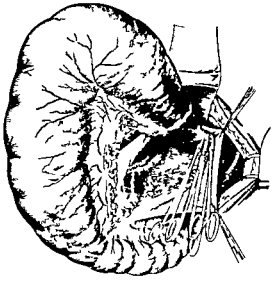


Figs. 1 to 6.—*1*, median suprapubic incision *A*, (inset), with cephalad left prolongation. *B* (main drawing), sigmoid delivered out of incision. Dotted line shows the trajectory of the incision of the right peritoneal sheet of mesosigmoid. Right ureter well individualized. *2*, right mesosigmoid peritoneal sheet incised and radicular lip dissected in an extension of about 3 cm. *3*, left mesosigmoid peritoneal sheet incised and radicular lip dissected in an extension of about 3 cm. *4*, levels of ligature of mesosigmoid vessels (*A*, inset), Drummond arcade sigmoidal and superior hemorroidal vessels. *B*, clamping and division of vessels, which are well individualized. *5*, ligature by transfixion of mesocolic vessels. *6*, posterior dissection of rectum.

Figs. 7 to 15 *(opposite)*.—*7*, division of middle hemorrhoidal vessels. *8*, final aspect of the mobilized sigmoidorectal segment. *9*, division of proximal sigmoid and rectum, after clamping with modified Wertheim clamps. *10*, sigmoidal and rectal stumps prepared for anastomosis. *11* and *12*, sigmoidorectal anastomosis in two rows of interrupted sutures, one total and another seromuscular. *13*, pelvic floor reconstructed. Drainage of presacral space with Penrose drain, which emerges from distal end of pelvic peritoneal suture. *14*, final aspect of the operation. The drain is delivered out from the distal end of the incision. Transverse colon exteriorized, to be opened twenty-four to twenty-eight hours later. *51*, final aspect of the operation, in a sagittal section. Low extraperitoneal sigmoidorectal anastomosis. Penrose drain in presacral space.



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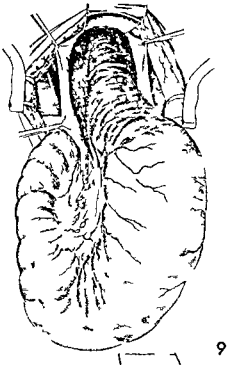

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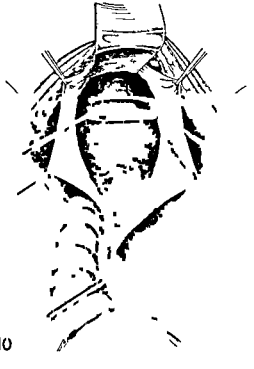

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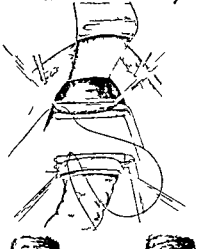

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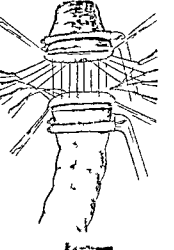

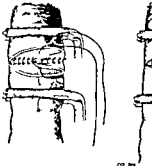

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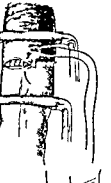

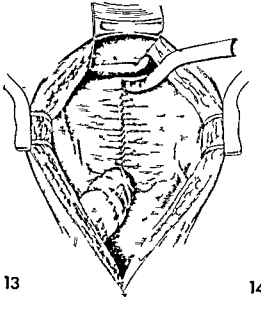

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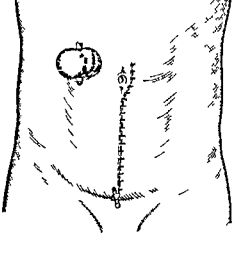

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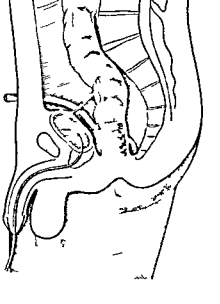

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pacity of the rectum and sometimes also of the sigmoid flexure, due to defective contraction of its muscular fibers caused by an inflammatory lesion with partial or total destruction of Auerbach's mienteric plexus. Resection of the diseased intestine as well as of the dilated colon should obviously cure the patient. As the operation is technically easier than abdominal rectosigmoidectomy and involves resection of a larger portion of the rectum, it has been used almost routinely.

It is my present opinion, after studies made in my country, that dyskinesia explains the pathogenesis of megacolon much better than does achalasia of the pelvirectal sphincter. The presence of this sphincter was recently denied by Prata,[2] who, in an exhaustive paper, demonstrated that there is no sphincteric anatomic structure in the pelvirectal region. At present, then, I perform rectosigmoidectomy, either abdominal or abdominoperineal, on the sole basis of the theory of dyskinesia of the distal portion of the intestine. I may mention that neither of these operations can be considered quite radical, because the lesions of the mienteric plexus always extend down to the anocutaneous juncture. As the rectocolic anastomosis is made some centimeters above this level, a segment of diseased intestine is obviously not removed. In spite of this fact, however, satisfactory results have been obtained with these operations, as I shall demonstrate later.

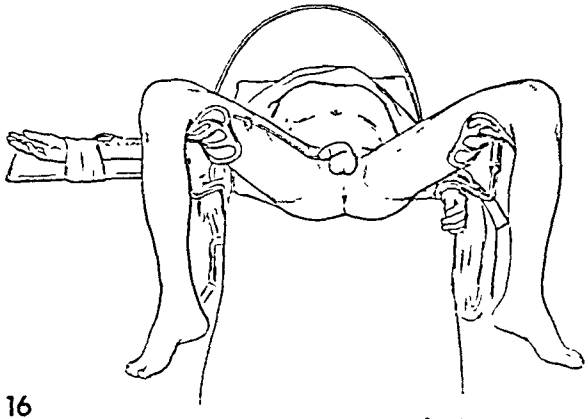

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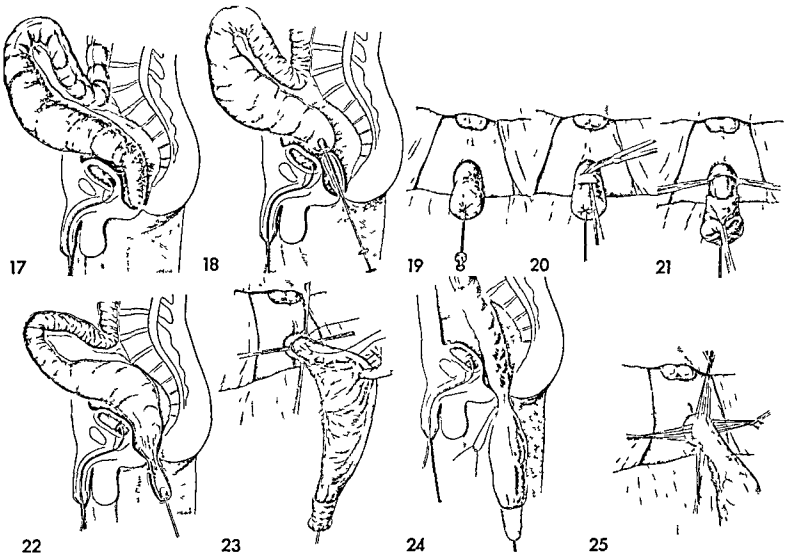
Fig 16.—Lithotomy position of patient on operative table. Moderate flexion of legs to pelvis.

Technic. — Abdominal rectosigmoidectomy: The technic I use for abdominal rectosigmoidectomy is similar, in a general way, to that of the anterior resection proposed by Dixon[3] and Wagensteen[4] for cancer of the rectum and rectosigmoid (though obviously without its inclusion of a wide resection of the mesocolon and the perirectal tissue, since I am not dealing with malignant disease).

After a large midline or left paramedian suprapubic incision has been made, the dilated sigmoid portion of the colon is delivered out of the abdomen. The patient is placed in the Trendelenburg position, and the mesosigmoid is incised on both sides, from a level slightly proximal to the dilated sigmoid flexure down to the peritoneal reflection (Fig. 1). Both the right and the left peritoneal radicular lip are then dissected free to the extent of about 3 cm., in order to facilitate the ultimate reconstruction of the peritoneal floor (Figs. 2 and 3).

The Drummond arcade and the sigmoidal and superior hemorroidal vessels are clamped, divided and ligated (Figs. 4 and 5). The rectum is dissected posteriorly (Fig. 6) down to the tip of the coccyx, anteriorly through Denonvilliers' space in the male or the rectovaginal space in the female to a corresponding level, and laterally. The middle hemorroidal vessels are clamped, divided and ligated (Figs. 7 and 8). Dissection is carried on close to the wall of the rectum, in order to minimize lesions of the autonomic nerves.

The colon and rectum are then divided, after protection with special personally modified Wertheim's clamps (Figs. 9 and 10). Division of the rectum is made as far distal as possible, at a level, however, that allows the safe performance of rectocolic anastomosis. This is done with two rows of interrupted cotton sutures (Figs. 11



Figs. 17 to 25.—*17*, sigmoidorectal segment dissected down to the anus. Stitch shows level of sigmoid to be divided at the perineal stage of the operation. *18*, obturator of a sigmoidoscopic tube introduced through anus and fixed at proximal level of rectum by a heavy silk ligature. *19*, rectum everted after traction on the tube. *20*, incision of rectal wall. *21*, incision of rectal wall completed. *22*, schematic sagittal aspect, showing rectum everted and incised *23*, sigmoid pulled out through anus up to level previously marked with a cotton stitch. *24*, schematic sagittal aspect of Figure 23. *25*, first row of sutures. Stitches applied to muscular coat of everted rectum and seromuscular coat of sigmoid.

and 12). It demands skill and patience on the part of the surgeon, as it is performed deep in the pelvic cavity.

Drainage of the presacral space is done with a Penrose drain, and the peritoneal floor is reconstructed with a continuous suture (Fig. 13). The rectocolic anastomosis remains extraperitoneal.

After a transverse colostomy has been performed through a stab wound made to the right and slightly above the umbilicus, the abdomen is closed. The Penrose drain is delivered out at the distal end of the surgical incision (Fig. 14).

Figures 1 to 15 show the different steps of the operation.

2. *Abdominoperineal Rectosigmoidectomy:* The patient is placed on the operating table in the lithotomy position, with moderate flexion of the legs to the pelvis (Fig. 16). After the abdomen has been opened, dissection of the sigmoid flexure and the rectum is carried on in a manner similar to that described for abdominal rectosigmoidectomy, with the difference that it is continued down to the level of the anal elevator muscles (Fig. 17). The proposed level of division of the sigmoid, to be made at the perineal stage, is marked with a cotton stitch applied to its mesenteric aspect.

The perineal stage of the operation is

started by introduction of the obturator of a sigmoidoscopic tube through the anus up to the proximal limit of the rectum. After being fixed at this level with a heavy silk ligature (Fig. 18) by an assistant who has remained in the abdominal area, the obturator is subjected to gentle traction and the rectum thus turned inside out (Fig. 19). This maneuver easily effects complete eversion or intussusception of the entire rectum and the lower segment of the sigmoid flexure through the anus.

The rectal everted wall is grasped with an Allis clamp, and an incision is made with scissors all around it, at a level approximately 2 to 3 cm. from the pectinate line (Figs. 20, 21 and 22). The sigmoid is then pulled out through the anus, up to the level previously marked by the cotton stitch (Figs. 23 and 24). Drainage of the presacral space is then carried out by means of a No. 30 rubber tube drain, which is delivered to the perineum through a stab wound made at the anococcygeal line.

Rectocolic anastomosis is performed in two rows of interrupted cotton sutures. In the first, the stitches are applied to the muscular coat of the everted rectum and the seromuscular coat of the sigmoid (Fig. 25). In the second, made after division of the sigmoid just distal to the first row of sutures (Fig. 26), the stitches are applied to all coats of the rectum and sigmoid (Fig. 27). Upon completion of the anastomosis, the rectum is pushed up through the anus with the finger (Figs. 28 and 29).

While the anastomosis is being done at the perineum, the assistants who have remained at the abdominal field reconstruct the pelvic peritoneal floor, perform the transverse colostomy and close the surgical wound.

Figures 16 to 30 show the different steps of the operation.

The technic of abdominal rectosigmoidectomy employed in my series was the one aforedescribed. In some cases the operation was performed in two stages: (1) resection of the dilated sigmoid flexure, with exteriorization of the two sigmoid stumps in the surgical wound, and (2) resection of the remaining sigmoid and rectum, followed by a low rectocolic anastomosis. In 3 cases, owing to technical difficulties, left proctohemicolectomy was performed, followed by anastomosis of the rectum to the transverse portion of the colon. Proximal colostomy was not performed in 35 cases, most of which were observed at the beginning of my experience. After unsatisfactory immediate postoperative results had been noted in some of these cases, it was decided to perform the operation as a routine.

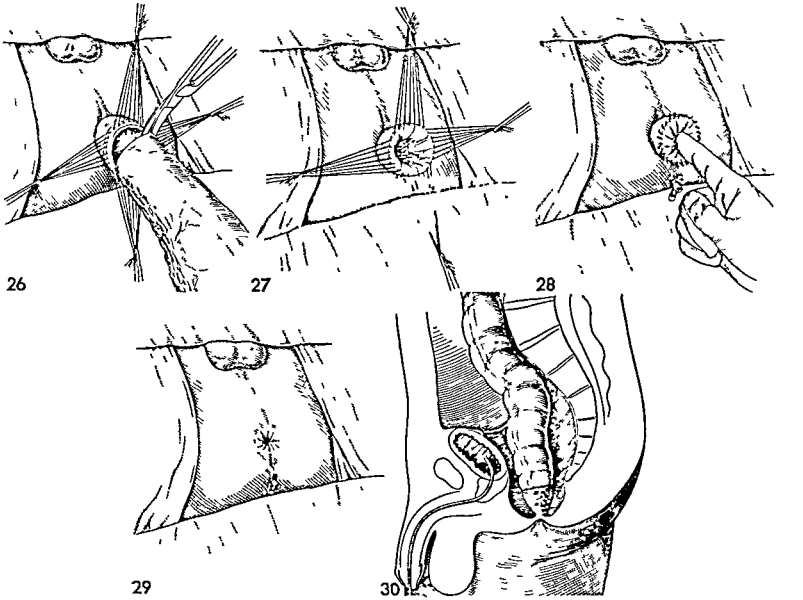
The technic used for abdominoperineal rectosigmoidectomy was also the one here described, or that of Corrêa Netto[5] in which the division of the rectum is done in the abdominal stage. The rectal stump is everted in the perineal stage; the colon is delivered out through the anus, and rectocolic anastomosis is performed with two rows of sutures.

Tactics.—The surgical tactics followed in this series varied with the problems presented by the patients, both at the moment of first encounter and on the basis of experience progressively acquired in the handling of the disease.

I shall not report the orientation followed in all the cases; rather, I shall describe only my present policies.

In uncomplicated cases the operation is performed in two stages: (1) rectosigmoidectomy and transverse colostomy, and (2) closure of the colostomy, which is done two or three weeks later. If sinus or disruption of the rectocolic anastomosis develops, the closure is postponed until one is quite sure that it has healed, which occurs in practically all cases; when it has not, some local supplementary operation must be done.

In cases of volvulus of the dilated sigmoid, a common complication (it occurred



Figs 26 to 30.—*26*, division of sigmoid *27*, second row of sutures Stitches applied to all coats of rectum and sigmoid *28*, reduction of everted rectum. *29*, perineal stage of operation completed Rubber drainage tube delivered out in the anococcygeal line *30*, final aspect of the operation, in a sagittal section Low extraperitoneal sigmoidorectal anastomosis Rubber drainage tube in presacral space

in about one-third of my patients), the operation is performed in three stages: (1) detorsion of the loop and transverse colostomy performed as an emergency operation; (2) rectosigmoidectomy, done two or three weeks later, and (3) closure of the colostomy. The performance of transverse colostomy at the first stage has two main advantages: (a) it promotes exclusion of the dilated sigmoid, which prevents or greatly reduces the danger of a new torsion, and (b) it obliges the patient to submit himself to the definitive operation I noted that many patients consented only to detorsion of the loop, only to have recurrence of this complication. One patient of this series had previously been operated on 11 times for this purpose.

In cases of volvulus with gangrene of the sigmoid portion of the colon, emergency sigmoidectomy is the operation of choice. No attempt is made to reestablish intestinal continuity; the proximal loop is delivered out through a stab wound as a colostomy and the distal one closed down at the level of the peritoneal cul de sac. Resection, followed by rectocolic anastomosis, is performed later.

Postoperative Complications. — Postoperativ com ations oc ain a fair num e w d

infection, pulmonary atelectasis, thrombophlebitis of the legs, peritonitis and obstruction of the small bowel; others, however, such as cystitic and partial disruption of the anastomosis, were comparatively common. Cystitis is supposed to result from a neurogenic bladder, which is frequently observed after these operations. With proper handling, no serious consequences resulted from this complication. Partial disruption of the anastomosis was the commonest postoperative complication. It developed usually as a sinus, which healed spontaneously in practically all cases. On some patients, however, posterior fistulectomy had to be performed.

Mortality.—There were 9 deaths in this series (4.5 per cent), 4 being associated with the abdominal and 5 with the abdominoperineal resection. Six patients died of peritonitis; 1 of postransfusional nephron syndrome; 1 of a complication of Chagasic myocarditis, and 1 of bilateral bronchopneumonia. It should be mentioned that after a better acquaintance with the operation and the routine performance of proximal colostomy, the mortality rate decreased considerably. Of the 130 patients last operated upon, only 4 died—2 of the deaths being due respectively to the nephron syndrome, and cardiac complications, and obviously not attributable to the operation itself.

Results.—The final results with both methods of rectosigmoidectomy were considered satisfactory. Follow-up studies were made of almost all patients subjected to abdominal rectosigmoidectomy, in some instances for eight years or longer. All "felt cured" except 2; endoscopic and roentgen studies revealed, in both cases, stenosis at the level of the anastomosis and proximal dilatation of the colon. In 1 case, notwithstanding the fact that the patient had daily bowel movements, roentgen studies showed recurrence of megacolon. Follow-up studies of patients subjected to abdominoperineal rectosigmoidectomy showed favorable results in all but 4 of the cases followed. Three patients had stenosis at the anastomotic line, and 1 had recurrence of the disease, in spite of the absence of any obstacle at the anastomotic level.

Anal continence remained normal in all patients subjected to abdominal rectosigmoidectomy. In those who underwent abdominoperineal rectosigmoidectomy it was frequently disturbed in the immediate postoperative course, the patients having had from five to fifteen daily bowel movements. This trouble disappeared, as a rule, in some weeks. In a few cases, however, slight incontinence for gases and liquid feces persisted for years. In 1 patient total incontinence was observed.

Sexual potency was studied in young male patients who had considered themselves sexually normal before the operation. There was a striking difference in sexual behavior after the two methods of rectosigmoidectomy aforementioned. No sexual disturbance was noted in patients subjected to abdominal restosigmoidectomy. In patients subjected to abdominoperineal rectosigmoidectomy, on the contrary, serious sexual troubles were observed. Six patients, aged respectively 20, 24, 26, 30, 32 and 38, complained of "coeundi" impotence. They were, of course, greatly worried about this new condition.

The exact cause of this grave disturbance is not yet well known. It probably results from lesion of the erector nerves in dissection of the lowest segment of the rectum, where these nerves have intimate connection with the rectal wall. Dissection of the rectum is carried down to the level of the anal elevator muscles in abdominoperineal rectosigmoidectomy, and at a more proximal level in abdominal rectosigmoidectomy. This probably explains the difference in sexual behavior observed after resection by these two methods.

Sexual complication was also observed

by Hallenbeck and Waugh[6] in a young man 27 years of age. These authors pointed out that male children subjected to abdominoperineal rectosigmoidectomy may feel sexually impotent when they reach adult life. This is also the opinion of State,[7] who imputes this disturbance to lesions of the erector nerves incurred in dissection of the rectum. Other experienced authors (Swenson and others;[8] Hiatt;[9] Bodian and others,[10] and Ehrenpreis[11]) do not refer to this complication. In a recent thesis, presented to the Faculdade de Medicina de São Paulo, I pointed out this problem.[12]

As one can see, it is a problem of major importance. My experience does not justify the conclusion that this operation leads commonly to this complication. The verification of sexual impotence, however, in the 6 young patients who had had normal sexual activity before they underwent abdominoperineal rectosigmoidectomy, strongly suggests that this operative method may result in this grave misfortune. The problem is a serious one and obviously demands careful investigation.

I may conclude, in retrospect, that rectosigmoidectomy, abdominal or abdominoperineal, deserves to be considered the present operation of choice for the treatment of megacolon, but that in establishing the indications for the latter operation it is necessary to consider the age of every male patient, owing to the possibility of its interference with sexual potency.

SUMMARY

The author refers to the two pathogenic bases under which rectosigmoidectomy was performed for the treatment of acquired megacolon, that of achalasia of the pelvirectal sphincter and that of dyskinesia of the distal portion of the intestine. He points out that the latter one is a better explanation for the disease.

The technic employed by the author in abdominal and abdominoperineal rectosigmoidectomy is presented. References are made to the tactics at present followed in complicated and uncomplicated cases and to the main postoperative complications and the mortality rate. The value of proximal colostomy is pointed out.

The results obtained in 200 operative cases are described. Special references are made to disturbances of anal continence and sexual potency.

The final conclusion is that rectosigmoidectomy, abdominal or abdominoperineal, deserves to be considered the operation of choice for the treatment of megacolon. In determining the indications for the latter, however, it is necessary to consider the age of the male patients, because of the possibility that sexual impotence will result—as occurred in some young patients in this series.

RÉSUMÉ

L'auteur se réfère aux deux bases pathogéniques sur lesquelles a été pratiquée la rectosigmoidectomie pour le traitement du mégacolon acquis, soit l'achalasie du sphincter pelvirectal et la dyskinésie de la portion distale de l'intestin. Il souligne que la dernière explique mieux cette affection.

L'auteur décrit sa technique de la rectosigmoidectomie abdominale et abdominopérinéale. Il cite les méthodes actuelles dans les cas simples et compliqués, et passe en revue les principales complications postopératoires en mentionnant les taux de mortalité. Il insiste sur la valeur de la colostomie proximale.

Les résultats obtenus dans 200 cas opérés sont exposés. L'auteur s'étend sur les troubles de la continence anale et du potentiel sexuel.

Il conclut que la rectosigmoidectomie abdominale ou abdominopérinéale mérite d'être considérée comme l'opération de choix dans le traitement du mégacolon. Quant à ses indications il est indispensable

de prendre en considération l'âge des patients mâles en raison de la possibilité d'une impotence sexuelle ultérieure, comme ce fut le cas chez quelques-uns de ses malades.

SUMARIO

O autor se refere às duas bases patogênicas sob as quais a rectosigmoidectomia foi realizada para o tratamento de megacolon adquirido, a da acalásia do esfincter pelviretal e a da disquinesia do porção distal do intestino. Chama a atenção para o fato de que a última é a melhor explicação para a moléstia.

A técnica empregada pelo autor na retosigmoidectomia abdominal e abdominoperineal é apresentada. Faz referências à tática que atualmente usa nos casos complicados e não complicados e às complicações pós-operatórias e média de mortalidade. Salienta o valor da colostomia proximal.

Descreve os resultados obtidos em 200 casos operatórios. Faz especial referências aos distúrbios da continência anal e potência sexual.

A conclusão final é a de que a retosigmoidectomia, abdominal ou abdominoperineal, merece ser considerada a operação de escolha para o tratamento do megacolon. Ao determinar as indicações para o último, entretanto, é necessário considerar a idade dos pacientes masculinos, por causa da possibilidade de que resulte a impotência sexual—conforme ocorreu em alguns pacientes jovens desta série.

RIASSUNTO

L'autore si richiama alle due teorie patogenetiche del megacolon acquisito: quella dell'acalasia dello sfintere pelvirettale e quella della discinesia della porzione distale dell'intestino. Quest'ultima sembra più adatta a spiegare la malattia.

La tecnica usata dall'autore nella rettosigmoidectomia addominale e addominoperineale viene decritta, con particolari relativi al trattamento delle complicazioni intra e postoperatorie. E' importante la colostomia prossimale.

Vengono riferiti i risultati ottenuti nella cura di 200 malati, con particolare riguardo ai disturbi della continenza ahale e della funzione sessuale.

La conclusione è che la rettosigmoidectomia addominale o addominoperineale è l'intervento di elezione nella cura del megacolon. Nello stabilire le indicazioni, tuttavia, è necessario tener conto dell'età del paziente, perchè può derivarne una impotenza sessuale.

ZUSAMMENFASSUNG

Der Verfasser berichtet über zwei pathogenetische Faktoren, die als Grundlage zur Ausführung der Resektion des Sigmoideums und des Mastdarms in der Behandlung des erworbenen Megakolons dienten, nämlich den Spasmus des Beckensphinkters des Mastdarms und die Dyskinesie des Endabschnittes des Darmes. Er hebt hervor, dass die letztere eine bessere Erklärung der Erkrankung abgibt.

Die vom Verfasser zur Ausführung der abdominalen und abdominoperinealen Resektion des Sigmoideums und des Mastdarms angewandte Technik wird beschrieben. Auf die in komplizierten und in unkomplizierten Fällen zurzeit angewandten Verfahren, auf die wesentlichen postoperativen Komplikationen und auf die Sterblichkeitsquote wird hingewiesen. Der Wert der proximalen Kolostomie wird hervorgehoben.

Die an 200 operierten Fällen erzielten Resultate werden beschrieben unter besonderem Hinweis auf Störungen der Kontinenz des Afters und Störungen der sexuellen Potenz.

Die Schlussfolgerung ist, dass es berechtigt ist, die abdominale oder abdominoperineale Resektion des Sigmoideums und des Mastdarms als Operation der Wahl

fur die Behandlung des Megakolons anzusehen Bei Abwagung der Indikation ist es allerdings notwendig, das Alter mannlicher Patienten in Betracht zu ziehen, weil, wie sich bei einigen jungen Kranken in der Serie des Verfassers herausgestellt hat, die Moglichkeit sexueller Impotenz als Folge der Operation besteht

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Life will give you what you ask of her if only you ask long enough and plainly enough

—Nesbit

In our own times, as well as in history, we may find lessons but never models

—Napoleon

A Procaine Sclerosing Solution for the Treatment of Internal Hemorrhoids

ROBERT EHRLICH, M.D.*

AND

TIMOTHY A. LAMPHIER, M.D., F.A.C.S., F.I.C.S., D.A.B.

BOSTON, MASSACHUSETTS

THE treatment of internal hemorrhoids is certainly a daily occurrence to the proctologist and is frequently encountered by those who do not limit themselves to proctology.

Not all hemorrhoids are amenable to injection therapy, since combined internal-external hemorrhoids, especially those of the prolapsing type, are preferably dealt with by hemorrhoidectomy. Statistical data as to the proportion of hemorrhoids treated by the sclerosing method vary widely, but the consensus is that from 25 to 50 per cent of hemorrhoids are amenable to injection treatment.[1] Those that are not pedunculated and present an adequate base are ideal for sclerosing therapy. On the other hand, some patients with prolapsing internal hemorrhoids are not good surgical risks, and sclerosing therapy serves as a palliative measure. A specific group of patients, therefore, will require treatment by injection. It is well to note that the end result is not always as desired with the large prolapsing type of internal hemorrhoids,[2] and therefore one should decide between the surgical or the sclerosing approach as best fits the pathologic picture in the individual case.

Postinjection Pain. — Discomfort associated with the treatment of anorectal conditions frequently deters the average patient from presenting himself to a physician for diagnosis and treatment. Therefore, much proctologic disease goes undiagnosed, and the opportunity to deal with rectal disease in its early stages is lost. Consequently, we were prompted to do this comparative study with a sclerosing solution, with and without procaine, as an approach to the alleviation of one phase of discomfort in the proctologic field.

The sclerosing solution of choice has been quinine and urea hydrochloride, since its sclerosing property is good and it is simple to handle, whereas phenol in oil is slow to inject and does not lend itself to a sufficient degree of asepsis. In addition, a painful oleoma frequently occurs as a result.[3]

With a 5 per cent quinine and urea hydrochloride solution we have observed that 55 per cent of a series of 200 patients complained of some degree of discomfort following injection. This varied from mild proctalgia to a severe sensation of intrarectal pressure with tenesmus, resulting in temporary incapacity. The onset of discomfort was usually fifteen to thirty minutes after the injection, and the duration varied from twenty minutes to two hours. Postinjection pain had been considered relatively infrequent, but systematic inquiry yielded the foregoing rather high incidence. Many patients made no complaint of their pain unless specifically questioned. Those with severe postinjection pain, however, invariably complained of the effect of the treatment.

Pain was overcome in part by the ad-

*Assistant Surgeon, Rectal Clinic, Boston Dispensary. Chief of Rectal Service, Otis Hospital, Cambridge.

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ministration of ½ gr. of codeine and 10 gr. of acetylsalicylic acid (aspirin). In many cases, however, the postinjection pain occurred before the analgesic effect could intervene. Therefore, a 2 per cent solution of procaine in a 5 per cent solution of quinine and urea hydrochloride was obtained* for comparative analysis.

Contraindications.—1. External hemorrhoids should never be treated by injection, nor should the needle be inserted distal to the anorectal line.

2. Idiosyncracy to quinine interdicts its use.

3. Inflammatory, infected or thrombosed internal hemorrhoids should never be treated by injection.

4. Complicating surgical conditions of the anus or rectum.

Technic.—The position of the patient is a matter of individual preference, but our routine is to have him assume the right Sims position. Through a Barr-Shuford or any desired proctoscope, the hemorrhoid to be injected is exposed and cleansed with an aqueous antiseptic. The injection is made into the hemorrhoidal mass, within the submucosal area. An average of 1 to 1.5 cc. of solution is injected slowly. It is not necessary to inject into the muscularis unless prolapse is encountered, and then it should be done with considerable caution. The overlying mucosa should not be distended beyond the stage at which it begins to blanch, since pressure necrosis, with sloughing, invariably results. It is difficult and undesirable to inject into the lumen of a vein, owing to the comparatively small caliber of the venous plexus, but if blood can be aspirated the needle should be withdrawn and reinserted. All injections should be made above the anorectal line, and, since the rectal mucosa is innervated by an autonomic supply, no pain should be caused by the insertion of the needle. If pain does occur, it usually indicates erroneous insertion of the needle. One or two hemorrhoids, depending upon the size, should be treated at intervals of about one week. If induration persists in a previously injected area, it is preferable to defer reinjection at that site.

Basis for Use of Procaine.—The obvious intention of the incorporation of procaine into the sclerosing solution was to control postinjection discomfort. The literature defines two other actions of procaine, however, which appeared applicable to its injection with a sclerosing solution; first, the effect of procaine in delaying absorption of penicillin, and second, its antihistamine-like effect.[4]

The parallel in sclerosing therapy was drawn because of the occasional side reactions of quinine manifested by vertigo, giddiness and nausea, and also because the degree of fibrosis might be enhanced by a staying action of a substance like procaine. The delaying action of procaine on the absorption of penicillin has been well established,[5] and it can therefore be presumed that the absorption of quinine and urea hydrochloride may likewise be delayed by the action of procaine. This serves to enhance the sclerosing property by allowing longer contact with the hemorrhoidal substance, and lessens the possibility of systemic reactions due to rapid absorption of quinine. Equally important is the postulate that procaine has a desensitizing action on quinine, since a clue may be found in the close chemical relation between procaine and the antihistamine drugs.[6]

Results.—Eight hundred patients were given injections of the procaine, quinine and urea hydrochloride solution, with a marked degree of amelioration of postinjection pain. The incidence of any degree of discomfort following injection was reduced to 32 per cent of those treated, as compared with 55 per cent of those treated without procaine. It was further noted

*Material for this study was supplied by Upjohn Company.

that the onset of pain was delayed by ten to thirty minutes longer than in the group not given the procaine mixture, so that frequently pain was not felt for one-half to one hour after treatment. Of the 32 per cent who had pain, it was mild and tolerable in 69 per cent, while in 31 per cent it was severe and incapacitating. Pain in the latter group was invariably mild during the limits of activity of the anesthetic agent, becoming severe only subsequently.

Systemic reactions to quinine were decidedly fewer in the group given quinine plus procaine. There were 28 patients who showed sensitivity to the quinine solution. The reduction of reactions to quinine might be predicated upon the delaying action of procaine on absorption and the postulate of the chemical relation of procaine to antihistamine drugs.

The induration following administration of procaine and quinine was generally more profound than that previously observed with quinine alone.

Incidence of Postinjection Pain

	% of Total Treated	*% Severe*	*% Mild*	*Average Duration*
Sclerosing solution without procaine	55%	52%	48%	20 min. to 2 hours
Sclerosing solution with procaine	32%	31%	69%	15 min. to 1 hour

COMMENT

Pain following sclerosing treatment for internal hemorrhoids has been a disturbing element in the nonoperative approach to this disorder. Although the period of discomfort is relatively short, the pain is none the less distressing and complicates an otherwise simple office procedure. The addition of 2 per cent procaine to the sclerosing solution not only reduced the incidence and severity of pain but delayed its onset, thereby shortening the total period of discomfort.

The routine use of 2 per cent procaine in sclerosing solutions used in injection therapy of internal hemorrhoids is advantageous, and is an important approach to the treatment of patients with this proctologic disease. The utmost care and consideration should be given to a locus of high sensitivity in examination or instrumentation of rectal patients.

SUMMARY

1. Analysis of 800 patients given 5 per cent quinine and urea hydrochloride solution as a sclerosing agent for internal hemorrhoids was made. The incidence of postinjection pain in varying degrees was 55 per cent.

2. The addition of 2 per cent procaine hydrochloride to the sclerosing solution reduced the incidence of pain to 32 per cent of 800 patients so treated. Of this group, 69 per cent had mild and tolerable discomfort, while 31 per cent had severe proctalgia. The duration of pain was shortened.

3. The lesser incidence of sensitivity reactions to quinine is thought to be based on the delaying action of procaine on the absorption of quinine and a questionable local antihistamine-like effect of procaine.

RIASSUNTO

1. Sono stati studiati 800 pazienti nei quali erano state praticate iniezioni sclerosanti di chinino e urea nelle emorroidi. Il dolore postoperatorio, di grado variabile, fu presente nel 55% dei casi.

2. L'aggiunta di procaina al 2% ridusse al 2% la frequenza del dolore postoperatorio in altri 800 pazienti. In questo gruppo il 69% ebbe un modesto e tollerabile fastidio, mentre il 31% ebbe un dolore notevole. Anche la durata del dolore fu abbreviata.

3. La diminuzione della reazione dolorosa alla chinina probabilmente è dovuta all'azione della procaina che ritarda l'assorbimento della chinina e che ha una discutibile azione antiistaminica locale.

RÉSUMÉ

1. Des analyses ont été pratiquées chez 800 malades ayant reçu 5% de quinine et de solution de chlorhydrate d'urée comme agent sclérosant pour des hémorrhoïdes internes. La fréquence des douleurs à des degrés divers après l'injection a été de 55%.

2. L'addition à la solution sclérosante de 2% de chlorhydrate de procaïne a réduit l'incidence des douleurs à 32% sur 800 cas traités. 69% des cas présentaient une gêne tolérable, alors que 31% souffraient d'une proctalgie grave. La durée de la douleur était écourtée.

3. La moindre fréquence des réactions douloureuses à la quinine provient sans doute de l'action diluante de la procaïne et de la possibilité d'un effet antihistaminique local de la procaïne.

SUMARIO

1. Foi feita uma análise de 800 pacientes a quem se deram quinino e solução de hidrocloreto de ureia como agente esclerosante para hemorroidas internas. A incidência da dôr após a injeção em vários graus foi de 55 por cento.

2. O acréscimo de 2 por cento de hidrocloreto de procaina à solução esclerosante reduziu a dor para 32 por cento dos 800 pacientes assim tratados. Dêste grupo, 69 por cento tiveram ligeiro e tolerável mal estar, enquanto 31 por cento tiveram séria proctalgia. A duração da dor foi diminuida.

3. Acredita-se que a menor incidência de reações de sensibilidade ao quinino está baseada na ação retardada da procaina na a sorção do quinino e em um efeito antida procaina.

ZUSAMMENFASSUNG

1. Es liegt eine Studie an einem Krankenmateriel von 800 Patienten vor, die wegen innerer Hämorrhoiden mit sklerosierenden Einspritzungen einer 5prozentigen Lösung von Chinin und Harnstoffhydrochlorid behandelt wurden. Die Häufigkeit des Auftretens von Schmerzen verschiedenen Grades nach der Einspritzung betrug 55%.

2. Der Zustaz von 2% Novocain zu der sklerosierenden Lösung setzte die Häufigkeit des Schmerzes bei 800 so behandelten Kranken auf 32% herab. In dieser Gruppe hatten 69% nur leichte und erträgliche Beschwerden, 31% aber heftige Mastdarmschmerzen. Die Dauer des Schmerzes war verkürzt.

3. Die geringere Häufigkeit des Auftretens von Überempfindlichkeitsreaktionen gegenüber dem Chinin glaubt man auf eine durch das Novocain hervorgerufene Verlangsamung der Absorption des Chinins und vielleicht auch auf einen etwas fraglichen örtlichen Antihistamineffekt des Novocains zurückführen zu können.

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Carcinoma of the Esophagus

Review of Two Hundred and Forty Cases

RAFAEL ALASCIO, M.D.

TUCUMAN, ARGENTINA

BETWEEN March 1950 and April 1955 I have observed and treated carcinoma of the esophagus in 240 cases. On the basis of this experience, I am able to record the data here presented.

Sex Incidence.—In this respect my observations are similar to those of other writers. Thirty-six of my patients (15 per cent) were women, and 204 (85 per cent) were men.

Age Incidence.—Almost all of my patients were between 50 and 70 years of age. None was under 20 or over 85 (Table 1).

Tumor Site.—Since my service is concerned especially with thoracic surgery, the most frequent site of esophageal carcinoma was the thoracic segment (195 cases, or 81.25 per cent). In 30 cases (12.5 per cent) the tumor occurred in the abdominal segment, and in 15 (6.25 per cent) it occurred in the cervical segment (Table 2).

In the majority of cases carcinoma of the thoracic segment of the esophagus was situated in the lowest portion thereof (135 cases, or 56.25 per cent). There were 28 lesions of the supra-aortic portion (18 per cent) and 37 of the para-aortic portion (11.79 per cent).

Of the tumors of the lower portion of the thoracic esophageal segment, 60 (30.6 per cent) occurred in the subaortic area and 75 (36.4 per cent) in the subdiaphragmatic region.

Operability (Table 3).—The organization of this hospital enables the staff to see patients in the early stages of disease. As a result, I have been able to establish two early syndromes. One of them is characterized by daily and rhythmic pain associated with eating, which may or may not be accompanied by a burning sensa-

TABLE 1.—*Age and Sex Incidence*

Age	No. of Patients	Male	Female
30-40	14 (5.8%)	8 (57.1%)	6 (42.8%)
40-50	32 (13.3%)	27 (84.3%)	5 (15.6%)
50-60	115 (47.9%)	100 (86.9%)	15 (13%)
60-70	69 (28.7%)	61 (88.4%)	8 (11.5%)
70-80	9 (3.75%)	7 (77.7%)	2 (22.2%)
80-90	1 (0.41%)	1 (100%)	
Total	240	204 (85%)	36 (15%)

TABLE 2.—*Incidence According to Site of Tumor*

Esophageal Location	No. of Cases	% of Cases
Cervical segment	15	6.25
Abdominal segment	30	12.5
Thoracic segment	195	81.25
Supra-aortic	28	11.79
Para-aortic	37	15.2
Subaortic	60	30.6
Supradiaphragmatic	75	36.4

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TABLE 3.—*Incidence According to Operability*

Clinically operable tumors	200 (83 3%)
Clinically inoperable tumors	40 (16 6%)
Cervical segment	2 (5%)
Supra aortic segment	8 (20%)
Para aortic segment	6 (15%)
Subaortic segment	6 (15%)
Supradiaphragmatic segment	8 (20%)
Abdominal segment	10 (25%)

TABLE 4.—*Incidence of Operation and Nonoperation in Cases of Operable Tumor*

Clinically operable tumors	200 (83 3%)
Operation refused	6 (3%)
Operation performed	194 (97%)

TABLE 5.—*Correlation of Tumor Site and Operative Status*

Site of Tumor	No of Cases	Inoperable	Operation Refused	Operation Performed
Cervical	15	2	2	11
Supra aortic	23	8	2	13
Para aortic	37	6		31
Subaortic	60	6		54
Supradiaphragmatic	75	8	1	66
Abdominal	30	10	1	19
Total	240	40	6	194

tion in the esophagus and stomach The other picture is characterized by intermittent dysphagia

In cases of the first type, after eliminating the possibility of duodenal ulcer or disease of the biliary tract, I direct my attention to the esophagus Roentgen and esophagoscopic examinations are done as soon and as often as is necessary to identify the pathologic change When intermittent dysphagia is present, I proceed in the same manner If an anatomic lesion is demonstrated, I perform a biopsy, if no lesion is demonstrated, I repeat the examination as many times as may be necessary In this way the patients are brought into condition for operation with a high probability of success

In a total series of more than 240 cases, 40 patients were considered clinically operable, 6 refused the operation, and 194 were operated on (Table 4) Of these 194 patients, 21 had nonresectable tumors as revealed by thoracotomy The tumors of 162 were resected The distribution of the nonresectable growths, according to localization, is indicated in Table 5

Type of Operation.—As is shown in Table 6, the tumors in 164 cases were located in the thoracic cavity and in 19 instances the abdominal cavity was the site All of them, however, were approached by thoracotomy In 11 cases the neoplasms were located in the cervical portion of the esophagus Nine of the 11 patients with

TABLE 6.—*Types of Operation Performed*

Operation	No of Cases	% of Cases
Cervical	11	
Wookey s	9	
Less radical procedure	2	
Thoracotomy	183	
Resection	162	88 52
With cervical esophagogastrostomy	19	
With thoracic esophagogastrostomy	134	
High	23	
Middle	41	
Low	70	
With thoracic esophagojejunostomy	9	
Operation without resection	21	11 42
Supra aortic	2	
Para aortic	4	
Subaortic		
S		

cervical tumors were subjected to the Wookey operation; the remaining 2 underwent less radical resection. The remaining 183 (with thoracic and abdominal tumors) were approached by thoracotomy, but in 21 instances the tumors proved nonresectable.

In 162 cases it was possible to perform esophagogastrostomy or esophagojejunostomy.

For tumors situated at a high level, anastomosis was performed in the neck. In 134 cases I was able to create the anastomosis in the thoracic cavity (23 over the aortic arch, 41 under the arch and 70 over the diaphragmatic muscle).

In 9 cases the extent of the lesion made it necessary to perform esophagojejunostomy instead of esophagogastrostomy. In cases of nonresectable tumor, in which a palliative procedure was indicated, I performed esophagogastrostomy (8 cases) or esophagojejunostomy (5 cases) without resection.

When it is possible to do so in a case of nonresectable tumor, I prefer to perform esophagogastrostomy without resection, but when the patient's condition requires caution I am content to perform anastomosis only.

End Results.—I have performed 194 operations for carcinoma of the esophagus. In 11 cases the tumor was located in the cervical segment; 2 of the patients died in the early postoperative period, and 9 are living at the time of writing. This represents a survival rate of 81.81 per cent.

The results in the 183 cases of thoracic tumor are as follows: Of the patients whose tumors were resected, 162, or 69.75 per cent, are living at the time of writing; 49, or 30.24 per cent, are dead. There were 21 patients with nonresectable tumors; of these, 2 have survived and the remaining 19 are dead. For the total series of 194 cases, the final results (Table 7) is survival of 124 patients (62.7 per cent) and death of 49 (38.5 per cent).

SUMMARY

Between March 1950 and April 1955 the author observed 240 cases of carcinoma of the esophagus, in 40 of which the

TABLE 7.—*End Results*

Operation	*No. of Cases*	*Death After Operation*					*Survival*
		Immediate	*2-3 Mo.*	*4-8 Mo.*	*8-12 Mo.*	*Longer*	
Thoracotomy	183						
Resection	162						
With cervical esophagogastrostomy	19				3	2	14
Intrathoracic esophagogastrostomy							
High	23	4			1	2	16
Middle	41	2		2	4	2	28
Low	70	1	3	4	9	4	50
Intrathoracic esophagojejunostomy	9	1			2	1	5
Palliative procedure (without resection)	21		4	6	8	1	2
Cervical operation	11						9
Wookey's	9	2					
Others	2	1					
Total	194			70 (38.25%)			124 (62.7%)

patients were discharged without operation and 6 refused operation. In 194 cases operation was performed, but in 21 resection was impossible because of the extent of the lesion and its metastases.

In 173 cases resection was possible, and various technics were used. The rate of survival was 62.7 per cent (124 cases) and the mortality rate 38.25 per cent, death having occurred in 70 cases. Nine patients died within forty-eight hours after the operation; 12 between four and eight months; 27 between eight and twelve months, and 12 after longer periods of survival.

The statistical picture will be improved when more patients accept operative treatment at an earlier stage of the disease and when surgeons make a point of operating as soon as possible.

The technical aspect of the author's therapy is not touched upon, since he intends to make it the subject of another work.

CONCLUSOES

De março de 1950 a abril de 1955 o autor observou 240 casos de cancer do esôfago, em 40 dos quais os pacientes tiveram alto sem operação. Seis recusaram a operação. Em 194 casos a operação foi feita, mas em 21 foi impossível fazer a ressecção, por causa da extensão da lesão e suas metástases.

Em 173 casos a ressecção foi possível, e várias técnicas foram usadas. A média de sobrevida foi de 62.7% (124 casos) e a média de mortalidade de 38.25%, tendo a morte ocorrido em 70 casos.

Nove pacientes morreram dentro das primeiras 48 horas; 10 entre 2 e 4 meses; 12 entre 4 e 8 meses, 27 entre 8 e 12 meses e 12 depois de períodos mais longos.

O quadro estatístico tornar-se-á melhor quando os pacientes aceitarem a operação em um estágio primário, e quando o cirurgião fizer a operação o mais cedo possivel.

O quadro ténico não é salientado, pois será objeto de outro trabalho do autor.

CONCLUSIONS

De mars 1950 à avril 1955 l'auteur a traité 240 cas de cancer de l'oesophage; 40 malades ont quitté la clinique sans opération, 6 ont refusé toute intervention. 194 cas ont été opérés; dans 21 cas la résection a été impossible en raison de l'extension de la lésion et des métastases.

La résection a été pratiquée dans 173 cas au moyen de techniques diverses. Taux de survie: 62,7% (124 cas); taux de mortalité: 38,25% (70 décès).

9 malades sont décédés au cours des premières 24 heures; 10 entre 2 et 4 mois, 12 entre 4 et 8 mois, 27 entre 8 et 12 mois, et 12 après des périodes plus longues.

Les statistiques seront meilleures quand les malades accepteront l'opération à un stade précoce.

Les techniques opératoires feront l'objet d'un travail ultérieur.

CONCLUSIONI

Dal marzo del 1950 all'aprile del 1955 l'autore ha osservato 240 casi di cancro dell'esofago; 40 pazienti furono dimessi senza intervento; 6 rifiutarono l'operazione; 194 furono operati ma in 21 fu impossibile eseguire la resezione per la diffusione delle lesioni.

In 173 casi fu possibile l'intervento radicale, eseguito con tecniche varie. La percentuale della sopravvivenze fu del 62,7% (124 casi) e la mortalità operatoria del 38,25% (70 casi).

Novo pazienti morirono nelle prime 48 ore; 10 dopo 2-4 mesi, 12 dopo 4-8 mesi; 27 dopo 8-12 mesi e 12 dopo un periodo più lungo.

La statistica potrebbe essere migliore se i pazienti acconsentissero a farsi operare in stadi più precoci e se il chirurgo potesse operare il più presto possibile.

Non viene trattata la tecnica, poichè su questo argomento verrà scritto un altro lavoro.

SCHLUSSFOLGERUNGEN

In der Zeit von März 1950 bis April 1955 sah der Verfasser 240 Fälle von Speiseröhrenkrebs. Vierzig dieser Kranken wurden als inoperabel entlassen, sechs lehnten die Operation ab. Unter den 194 operierten Fällen war eine Resektion bei 21 Kranken wegen der Ausdehnung und Metastasierung der Erkrankung unmöglich.

In 173 Fällen konnte eine Resektion ausgeführt werden, wobei verschiedene Techniken zur Anwendung kamen. 63.9 Prozent aller operierten Kranken überlebten den Eingriff (124 Fälle), und die Sterblichkeitsquote betrug mit 70 Todesfällen 36.1 Prozent.

Neun Kranke starben innerhalb von 48 Stunden nach der Operation, zehn innerhalb von zwei bis vier Monaten, zwölf swischen vier und acht Monaten, 27 zwischen acht und zwölf Monaten und zwölf nach längeren Zeitabschnitten.

Eine Besserung der Statistik lässt sich erwarten, wenn die Kranken sich in einem frühen Stadium zur Operation bereit erklären und der Chirurg den Eingriff so bald wie möglich ausführt.

Auf die technische Seite des Problems wird nicht besonders eingegangen, weil dies in einer weiteren Arbeit des Verfassers zur Sprache kommt.

It is impossible to cure all patients; that would be an achievement surpassing in difficulty even the forecasting of future developments. But seeing that men die before the physician is able to bring his skill to grapple with the case—some owing to the violence of the disease die before they have summoned the doctor, some as soon as he arrives; some live one day, others a little longer—in view of this, an understanding of such diseases is needed. One must know to what extent they exceed the strength of the body and one must have a thorough acquaintance with their future course. In this way one may become a good physician and justly win high fame. In the case of patients who were going to survive, he would be able to safeguard them the better from complications by having a longer time to take precautions. By realizing and announcing beforehand which patients were going to die, he would absolve himself from any blame.

—*Hippocrates*

Editorial

Medical Illustration

Its History and Present Day Practice

YEARS ago I considered medical illustrations simply a little adjunct—a useful device of some value in the teaching of anatomy, surgery, pathology and other branches of medical practice. But, as the years rolled by, I could not help but be impressed with the great interest of the medical profession in good illustrations. As I delved a little into the history of medical illustration I came to realize that pictures have played a vital rôle not only in teaching but in the actual development of surgery to its present high levels, and there is good reason for this.

To illustrate: To make diagrams and pictures of a subject one is studying is a natural instinct of the human intellect when it attempts to comprehend anything. In fact, it might almost be said that comprehension consists of just that—the ability to visualize the subject. We say that we understand something; we mean that we can diagram it mentally. We say that we understand the heartbeat; we mean that we have a mental image of the heart in systole and diastole—of the synchronized opening and closing of the valves. We can visualize the conduction system, etc. We say that we understand acute cholecystitis; we mean that we have a mental image of an acutely inflamed gallbladder. We say that we understand the kneejoint; we mean that we can visualize the semilunar cartilages, the heads of the bones, the cruciate ligaments and the quadriceps muscles.

Illustration simply consists, then, of transferring this mental image or diagram from our minds to the paper or to any other medium. Indeed, the success of an illustration often depends on how accurately and effectively we transfer this image to the paper. This is not always simple, for often, in the course of making a drawing, the artist or the physician becomes infatuated with his own artistic creation and finds himself adding a little of this and a little of that to embellish the drawing until the essential point of the picture, the original image in the artist's mind, is all but lost.

Medical illustration may be said to have three main functions: First, it helps the student or physician who is studying a subject to clarify it in his own mind. As he "doodles" the thing out on paper, as he studies it, he is aided in forming a mental image of the subject. In this sense the hand cooperates with the brain. Second, it helps to transmit ideas to others, as in a lecture, a private conversation, a conference or a published article. Third, it serves to preserve ideas for posterity, e.g., in a book or other publication.

I should like to call particular attention to the last two, for it is by means of these two factors that the progress of surgery has been aided by ill

Now I do not wish to detract from the glory of the great geniuses who have made such vital and far-reaching discoveries in medicine and surgery in the past few decades; who have, in fact, almost revolutionized medical and surgical practice. Nevertheless, these great discoveries represent the culmination of the efforts of many men adding piece by piece, bit by bit to knowledge, until the final great discovery is made that clinches the matter. Our modern surgical and medical edifice has been built block by block by men who have added their stones one at a time, in different eras and in different parts of the world. This cooperative enterprise has been made possible through the dissemination of ideas, through the accurate depiction of one man's thinking, the accurate transmission of this man's thoughts to another man in a different part of the world and at a different time. The written word has served to a great extent in accomplishing this, but, in my opinion, so far as surgery is concerned, illustrations have been even more vital. It is only through a drawing that one can really transmit the concept of a procedure to one who is not actually present.

Evidence that it is instinctive in man to make pictures or diagrams of his ideas is found in the fact that the earliest men did this; men of all races and at all times and in all places have resorted to illustrations of one sort or another in putting down their ideas. The cavemen cut into stone their ideas of what went on in the human body. The ancient Egyptians and Babylonians made crude medical illustrations. So did the American Indians. I have seen diagrams made by the American Indians in their inimitable primitive style, telling how an Indian ate some bad fish, got a fire in his belly and finally died. They actually drew a picture of a man with a fire in his belly, and they had some concept of anatomy, too, for they indicated the intestines and some of the viscera. It is interesting to note their concept of fire as related to the origin of our term *inflammation.*

Throughout the middle ages, little was done in the field of medical illustration. Steeped in mysticism as those times were, medicine sank to a very low ebb and medical illustration, together with all learning and all knowledge, sank with it. Even Galen, in the second century, though he contributed so much to medical knowledge, apparently did not attempt to illustrate his prodigious writings. If he did, there is certainly nothing left of his work in this field. I attribute this largely to the fact that in those days there were no means of printing or reproducing illustrations. Certain it is, however, that when knowledge and medical science blossomed forth anew at the coming of the Renaissance, so also did medical illustration burst into bloom.

I do not know to whom credit should be given for the flowering of medical illustration at this time but certainly it is closely related to the advent of the great genius who lived and worked in Florence and in parts of France at about the time Columbus discovered America. I refer, of course, to the great Leonardo da Vinci. If Leonardo was not the greatest genius of all time, he certainly was one of the most versatile and universal.

Leonardo's essential characteristic was a fervent search for unity in all knowledge and all accomplishment. He studied and made contributions in practically every field of human endeavor, in science and in art. He was a great astronomer, geologist, engineer, physicist, philosopher, inventor, architect and, of course, painter and sculptor. Dukes called on him to build their palaces and their fortifications, to make their statues and their monuments and to paint their ladies' portraits. He directed their pageants; he built their canals. He designed cannons and devised the first tanks, though he hated and condemned warfare. He was kind and gentle. Often

he would buy birds just to set them free. He studied their flight, and, if he had had motive power at his disposal, he certainly would have invented a practical airplane. He did develop a practical submarine. He studied the winds and the air currents. He believed and taught that the earth revolved around the sun. He anticipated Newton's law of gravitation. He knew that the sea had at one time covered Italy and that the folding of the earth's crust countless aeons ago had raised the mountains and plains above the sea level. I need scarcely touch on his painting, for everyone knows that he created two of the best known, best loved and most valuable paintings of all time—the "Mona Lisa" and the "Last Supper."

Leonardo's anatomic studies and illustrations are all the more remarkable when one realizes that he had no texts and practically no reference material of any kind. He had no *Gray's Anatomy*, no dissection manual to guide him. He had to create his own methods and technics. In his lifetime Leonardo made approximately thirty dissections. It is amazing to realize that this man obtained from these thirty dissections as sound a comprehension of the construction of the human body as he revealed. Anyone who has done much dissection knows how difficult it is, even with a manual at hand, to trace out any system; yet this man, struggling under the most difficult conditions and hampered by the superstitions that had been built up through many ages, accomplished things that have placed him among the immortals.

There were two great characteristics in Leonardo's work: In this field as in others, he believed in basing his studies on fact rather than on authority. He gave the world some excellent advice: If you find from your own experience that something is a fact, and if it contradicts what some authority has written, you must abandon the authority and base your reasoning on your own discovery of the truth.

He was much criticized for this; many so-called wise men said that his ideas of anatomy could not possibly be true, because some authority, some mysticus of the Middle Ages, had written down—out of his imaginings, doubtless—that things were quite different. But Leonardo cared little for the opinions of these people, and he expressed his opinion of them very pointedly: "I care no more for the wind that issues from their mouths than I do for that which issues from their hinder parts."

The second great characteristic of Leonardo's anatomic studies is that they prove him to have been a functional anatomist. In this sense he had really a modern outlook. He wanted to understand *why* the anatomic structure was as he found it. He sought constantly for the significance of anatomic facts. He has been called the founder of physiologic anatomy. For example, he made accurate and careful studies of the exact form and contour of the muscles; but, not satisfied with this, he went further and represented them schematically as cords or strings. In this way, he said, one could get a better understanding of muscular action and the direction of pull.

The significance of this remarkable physioanatomic approach in a man who lived five hundred years ago was forcibly brought home to me only recently. When I was in Europe, I visited some of the outstanding professors of anatomy. On two occasions, after being greeted with the proper ceremony into the *sanctum sanctorum* of more than one good professor, I was told: "Dr. Netter, we admire your pictures very much for their clarity and for their accuracy. In fact, we are quite surprised at the detail of the information you have included, but we do not understand why you mix up so much physiology and so much clinical medicine with your anatomy." Of course, I oo v

this. I attempted to explain that this was precisely what I was trying to do—to give meaning and clinical significance to the morphologic facts I was depicting. This, however, they could not or would not understand. To them anatomy was a pure science and, like most things that are 100 per cent pure, also 100 per cent sterile. Theirs was the purely didactic approach. They awed their students simply by the force of memorized but useless facts. They were secure in their ivory towers; they knew all the facts, but they would not stoop to apply them.

For many years the science of anatomy suffered from this attitude. Some thirty or forty years ago anatomy was a dead subject. All that was or was to be known was already written down in the books. It simply remained to memorize the books. To find any fact one simply had to turn to a certain page in any standard textbook of anatomy. In the last few decades, however, there has been a new crop of anatomists who have returned to the physiologic and clinical approach. These men are again asking "Why?" and "What is the significance?" As a result, there has been a rebirth of interest in anatomy, and anatomy today is again a living science. Investigators are turning to it more and more as a source for explaining phenomena. For example, study of the spiral arteries of the endometrium has had much to do with developing the modern concepts of menstruation. Modern reparative surgery of the hand is based almost entirely on the functional aspect of anatomy. Even modern understanding of the function of the hypothalamus in regulating the activity of the pituitary and endocrine functions of the body has developed largely through the combined anatomophysiologic studies of the neurohumeral mechanism of the hypothalamic cells. Leonardo, with his inquiring mind, could not help being an anatomophysiologist.

Since Leonardo was an artist, many may have the impression that he was chiefly concerned with surface anatomy. In general, this was true of the other artist-anatomists of the time, including such men as Michelangelo, Raphael and Albrecht Durer. But Leonardo went much deeper. He studied the viscera, the nervous system, the circulatory system. He studied and drew the details of the larynx in order to gain an understanding of voice production. His drawings penetrated into comparative anatomy, depicting the physical structures of the lower animals in relation to their counterparts in man. He actually made injection preparations of the ventricles of the brain.

Leonardo's remarkable anatomic illustrations were not published in his lifetime. At that time, in fact, illustrated medical texts were nonexistent. Shortly thereafter, however, the idea of publishing anatomic plates began to take hold. Among the earliest to appear were those of Charles Estienne, a Paris physician who collaborated with a surgeon, Riviere. Estienne employed a number of artists to make drawings, but apparently he had difficulty in getting the idea across to these artists that the purpose of the drawing was to elucidate anatomic facts, not to create fanciful artistic monstrosities. At times the artists would get completely out of hand and run riot with the drawings. Often, in illustrating a single anatomic detail, the artist would draw in the entire human figure and then embellish it with a decorative background or a landscape until the essentials of the picture were all but lost. The drawings are generally rather crude but sometimes a little amusing; for example, in an illustration of the dura mater, the artist has drawn the entire figure in an active pose, with a calvarium removed and hanging on a nearby tree as though the subject had just taken it off and hung it there as he would his hat. To Estienne, however, must be given the

credit which is due a pioneer, for a pioneer he was.

We now come to the great Andreas Vesalius, who established a landmark in the history of medical illustration. He has been called the father of modern anatomy. His works were the forerunners of the modern anatomic atlases. Vesalius was born in Brussels in 1513 or 1514, into a family of physicians. He studied in France, traveled rather extensively, became court surgeon and finally took the professorship of anatomy at Padua. His life was devoted to revolutionizing the teaching of anatomy, and this he chose to do through the medium of published anatomic illustrations. He employed a number of artists to make drawings of his dissections, but the man who probably made most of the illustrations was John Stephen of Calcar, a brilliant pupil of the great painter Titian. It has been said that Titian himself made some of the drawings for Vesalius, but most historians do not credit this. Vesalius appears to have had considerable trouble with his artists, both because of temperamental difficulties and with the problem of getting them to depict the structures accurately. Often the artist and the anatomist berated each other heatedly. When one realizes, however, that no preservative or embalming fluid was used in the specimens of those days, one can scarcely blame the artists if they preferred painting Madonnas to using a stinking carcass as a model. Vesalius always managed to get Stephen of Calcar back to work, however, by offers of more money. It is amazing how the artistic temperament succumbs to the influence of this commodity.

In both anatomic accuracy and artistic quality the works of Vesalius were far in advance of anything done up to that time. The drawings are made with exquisite precision and power, and they reflect the high levels of art and learning of that time as well as the calibre of the artists who made them. Much of their charm is derived from the graceful pose of the figures and from the lovely bits of landscape and background with which the artists embellished them. These background bits of artistic fancy, however, are never so dominant as to interfere with the clarity of the illustrations. They may have served a useful purpose as well, for at that time, although it was considered proper to make anatomic studies for artistic purposes, the practice was somewhat frowned on when pursued in the name of medical science. Despite Vesalius' prodigious labors, he never lost his love of travel. He finally died in a shipwreck in 1564.

A contemporary of Vesalius, Giovani Canano, also began work on an atlas of anatomy at about the same time, but when he heard of Vesalius' superior achievement he gave up the project, completing only one small volume on the upper extremities.

Vesalius really started something. The idea of illustrated anatomic and medical texts took hold, and there followed a number of similar enterprises. Vesalius' pictures were reproduced from woodcuts, but soon thereafter many of the pictures were printed from copper or steel engravings. Some of the outstanding works were those of Eustachi, Varolio (on the brain), Casserio, Spigelius, Bartholinus, Santorini, L'Admiral and Scarpa. Many of these names are preserved to us today in our modern anatomic nomenclature; thus we have the eustachian tube, Santorini's duct, the Spigelian lobe of the liver, Bartholin's gland and Scarpa's fascia.

William Hunter, the celebrated English physician and obstetrician of the eighteenth century, founded with his own money an institution for the study of anatomy. He employed a number of artists to make drawings, most of which depicted the gravid uterus. John Hunter, his brother and a distinguished surgeon,

helped in this project, particularly with the anatomic studies.

The next great step forward in medical illustration came with the invention of lithography, about 1800. Up to this time all of the illustrations had been reproduced from woodcuts or from copper or steel engravings of one sort or another. This meant that the artist first had to make the drawing, after which an engraver copied it and actually engraved or carved it into wood, copper or steel. This was a tedious and expensive process. Sometimes much of the quality and accuracy of the original drawing was lost in the engraving, and fine gradations of tone or shading were difficult or impossible to reproduce.

Lithography is a process of printing based on the mutual repulsion of oil and water. In the original process the drawing was made on the stone with a grease crayon. The stone was then wet with water, but the water wet only the stone and not the greased area. An oily ink was then applied, and this in turn did not adhere to the wet stone but remained only on the crayon marks — the heavier the crayon the heavier the ink. The stone was then applied to paper, and a duplication of the drawing appeared. To reproduce colored illustrations, a separate drawing was made on a separate stone for each color, the drawing of course being carefully and accurately registered. Each stone was then printed in ink of a different color, one superimposed on the other. Through lithography a number of exquisitely illustrated anatomic, medical and surgical texts appeared in the nineteenth century. I cannot possibly enumerate them all, but will mention a few. A beautiful and elaborate series of anatomic plates was published by Jones Quain about 1842. Another outstanding example was the work on surgical anatomy of Joseph Maclise, published in 1851. The French seemed to have developed lithography to its highest point of artistry, and the *Treatise on Fractures* by Anger and Velpeau, published in 1865, was an outstanding example. This beautiful volume, which contains one hundred lithographed plates in full color, is reproduced with exquisite fidelity and realism.

It is obvious, then, that the development of medical illustration went hand in hand with improvements in the reproduction process. The final great advances in pictorial reproduction came with the invention of photoengraving in 1868, the halftone screen in 1880 and finally the four-color printing process in 1893. These made it possible to reproduce pictures efficiently, accurately and economically by photomechanical means. It made possible the reproduction of practically any type of drawing in all gradations of tone and even in color, although color printing even today is costly.

In 1894 there came to this country from Germany an artist named Max Brodel. He was brought here largely through the influence of Drs. Kelly and Cullen of Johns Hopkins Medical School, and he voluminously illustrated many of Dr. Kelly's writings and also those of other famous Johns Hopkins physicians. Brodel did much to advance the standards of medical illustration in the United States, and a school for medical illustration was founded at Hopkins under his direction. He developed what is known as the scratch board technic. In this technic a special clay-coated paper is used; it is known as Ross board. The drawing is made with black chalk dust applied with brushes and then blended to the desired shading. The highlights are then scratched out with a sharp instrument, which gives a very luminous effect to the illustration.

Max Brodel and a number of his students made many beautiful and excellent drawings with this technic. Unfortunately, however, it became somewhat of a fetish, and some artists who came later seemed to have got the notion that making

a good medical illustration depended not on depicting the subject correctly but simply on the use of this technic. I do not mean to condemn the technic, for I have used it myself and I believe that good and bad drawings can be made in any medium. I simply wish to caution against permitting any technic to become more important than the drawing itself.

Another pioneer in American medical illustration was Tom Jones of Chicago. He illustrated the *Cross Section Anatomy* by Eycleshymer, Curtis' *Textbook of Gynecology* and many other works, and he also founded a school for medical illustration at the University of Illinois. Jones employs a wash or water-color technic and also works in pen and ink. A number of other schools for the teaching of medical illustration have since been started in various institutions throughout the country. The art has also been fostered through the employment of artists by various institutions and hospitals. It is unfortunate, however, that more funds are not available for this purpose today and that many of the large hospitals and even teaching institutions do not have medical artists on their staff. Medical publishers also have become highly picture-conscious, but unfortunately they do not make sufficient funds available to the artist to make it worth his while to labor in this difficult but important field.

I am often asked "How did you ever get the idea of going into the field of medical illustration instead of the actual practice of surgery?" The truth of the matter is that I never really got the idea; I fell into it, so to speak, gradually. I started out in life with every intention of being an artist and not a doctor. I studied at the National Academy of Design and at the Art Students' League and actually did considerable commercial illustration, portrait work and scenic painting; I dabbled in practically every field of art. But then I changed my mind and decided to be a doctor, truly believing that I was through with art for good. In medical school, however, I found that I could learn my subjects better by making drawings in my notebooks than by attempting to memorize the texts. As a result, my books were full of sketches. Some of my professors noted my drawings and asked me to illustrate their articles and books, and this occupied most of my spare time in medical school and during my internship. On opening my office I once more put away my art supplies, intending to devote myself exclusively to surgery. But those were the days of the depression, and there seemed to be more demand for my pictures than for my practice. The day finally came when I was so busy with pictures that it was necessary for me to make a choice between the two fields, and happily, I chose illustration. Since then I have worked on many interesting projects. One of the most arduous of these was building the "transparent woman" for the San Francisco Golden Gate Exposition. This was a transparent figure of a woman seven feet high, with a synchronized voice that told the story of the female endocrines. It depicted the menstrual process and the development and birth of a baby as well as the physical and sexual development of a woman. I labored on this project day and night for seven months. An interesting sidelight in my career was my being commissioned to paint a series of twelve incidents in the life of a physician. This consisted of a series of large paintings of such subjects as the boy sitting up the night before the osteology exam, studying away to the point of exhaustion; the emergency ward; the ambulance call; the class reunion; the country night call, etc.

During the war I was in the army, stationed first at the Army Institute of Pathology and then at the Surgeon General's Office, in charge of graphic training aids for the medical department. The army soon learned the value of pictures as time-

savers in teaching medical and semimedical subjects. Being an officer, I was not supposed to make drawings myself, which was fortunate, since many of the projects given me called for as many as a thousand or more illustrations! I would plan them, sketch them roughly and lay them out to be executed by others. We produced a number of manuals and portfolios on such subjects as first aid for combat troops, roentgenology for technicians, sanitation in the field and survival in the tropics.

After the war I devoted more and more of my effort to working under the sponsorship of the Ciba Pharmaceutical Products Co. Several years ago I began, under Ciba sponsorship, a monumental project illustrating the entire anatomic and pathologic character of the human body, system by system, and this project I expect to occupy the major part of what remains of my working career. Thus far two volumes have been published, *The Nervous System* and *The Reproductive System. The Digestive System,* because it is so voluminous, will be published in three parts: first, *The Liver, Gallbladder, Bile Ducts and Pancreas,* which is now in press; second, *The Alimentary Tract, from the Mouth through the Stomach,* and third, work covering the remainder of the alimentary tract. From there on we shall progress to the circulatory system, the endocrine system, and so forth. I do not, however, expect to follow a purely systemic approach; I shall deviate occasionally from this to a regional one. For example, I expect to do a volume on the extremities and another on the head and neck.

Now as to how I work: I cannot give a sure-fire formula for making a successful medical illustration. I believe that each artist develops his own methods and technics, but I shall try to offer a few basic principles and to tell a little how I, personally, make a drawing. First comes the study, and this is the most difficult and unquestionably the most important part of the entire undertaking. I never start a drawing until I have a thorough grasp of the subject matter. When I say a thorough grasp, I mean not just a good enough understanding to make the picture; I must understand it so well that I feel perfectly at home in the field; so well that I understand the essential points, the points to emphasize and the points to eliminate. I must know exactly what I am trying to express with this picture, what I am trying to say and what idea I am trying to transmit.

This study is done in various ways. First come talks with the consultant. For each subject we try to choose a consultant who is outstanding in the field. This may mean trips to various parts of the country, but they are worth the effort. Then I make an intensive study of the published literature. Visits to hospitals are sometimes necessary to observe clinical cases, pathologic or surgical specimens or operative procedures. Sometimes an original dissection is necessary. When I feel that I have thoroughly grasped the subject and can mentally visualize what I want to put on paper, I proceed with the sketch, trying always to keep my original mental image from becoming befuddled. I make my sketch on a tissue or tracing pad, using cheap pencils both for the sake of economy and because I find that the points stand up better than do those of the expensive ones.

Always keeping the fundamental idea of the picture in mind, I have found three basic considerations that are useful in planning a picture: first, the point of view; that is, whether the subject is to be viewed from above, the side, the rear, etc.; second, the plane; that is, the depth to which the dissection will be carried, since in some pictures two or three or four different planes of dissection may be necessary. For this reason I believe that the medical artist must be a good visu-

alizer of anatomy. Finally, there is the consideration of focus. By this I mean, the extent of the area that is to be included in the illustration. Am I to draw in the entire body, half the body, or only a small area?

Having completed the sketch, I transfer it to a piece of illustration board for the finished drawing. I do this by blacking up the back of the picture with a soft pencil, taping the tissue down on the illustration board with Scotch tape, going over the lines with a hard pencil. I have used various media for my finished illustrations over the years but I now work almost exclusively in what is known as opaque water color, which artists call "gouache"—ordinary transparent water colors mixed with white paint. I could not hold for this medium; I [illegible] my preference because I have found that I [illegible] me with it and can work more [illegible] with others. In this field it [illegible] for the artist to feel at home [illegible] medium of his choice himself should [illegible] the medium in which

the drawing, he cannot concentrate adequately on the subject matter he is trying to depict. As one works with a medium, one learns many little tricks and devices that will help to give a certain effect.

Finally, I should like to express my appreciation for the help and encouragement I have had over the years from Dr. Frank Oppenheimer, who has edited [illegible] times, to edit the Ciba volumes on which I am now at work. Wherever I am, it is [illegible] to where I can obtain certain information he is able to get it for me, and whenever I am faced with a problem of finding a good [illegible] similar publications, however [illegible] I am faced with the problem [illegible] I can overcome it. [illegible] artists of any medium [illegible]

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New Books

Books Received.—The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

Proctology. By Harry E. Bacon, Stuart T. Ross and Porfirio M. Recio. Philadelphia: The J. B. Lippincott Company, 1956. Pp. 441, with 228 illustrations and 5 color plates. *Reviewed in this issue.*

Principles and Methods of Sterilization. By John J. Perkins. Springfield, Ill.; Charles C Thomas, Publisher, 1956. Pp. 340, with 174 illustrations. *Reviewed in this issue.*

Clinical Laboratory Methods and Diagnosis. By R. B. H. Gradwohl. St. Louis: The C. V. Mosby Company, 1956. 5th ed. 2 vol. Pp. 2452, with 765 illustrations and 52 color plates. *Reviewed in this issue.*

Klinische Funktionsdiagnostik. By H. Kuchmeister. Stuttgart: Georg Thieme Verlag, 1956. Pp. 411, with 152 illustrations. *Reviewed in this issue.*

The Postural Complex: Observations as to Cause, Diagnosis and Treatment. By Laurence Jones. Springfield, Ill.; Charles C Thomas, Publisher, 1956.

Ulcers of the Legs. By P. Piulachs. Springfield, Ill.; Charles C Thomas, Publisher, and Oxford, England: Blackwell Scientific Publications, Ltd., and Toronto, Canada: The Ryerson Press, 1956. Pp. 573, with 303 illustrations.

The Biologic Effects of Tobacco. Edited by Ernest L. Wynder. Boston: Little, Brown & Company, 1955. Pp. 218.

The Recovery Room. By Sadove and Cross. Philadelphia: The W. B. Saunders Company, 1956. Pp. 597, with 103 illustrations.

Plastic Repair of Genito-Urinary Defects. By George Bankoff. New York: The Philosophical Library, 1956. Pp. 345, with 86 illustrations. *Reviewed in this issue.*

The Treatment of Fractures. By Lorenz Böhler. New York and London: Grune & Stratton, Inc., 1956. Vol. 2, translated from 13th German edition. Pp. 1072, with 1,721 illustrations. *Reviewed in this issue.*

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 374, with 145 illustrations.

Tumors of the Skin. By Herbert Conway. Springfield, Ill. Charles C Thomas, Publisher, 1956. Pp. 267, with 178 illustrations, 3 in color.

Supplement 1, Atlas of Exfoliative Cytology. By George N. Papanicolaou. Cambridge, Mass.: Harvard University Press, 1956. Looseleaf format, published for The Commonwealth Fund.

Handbook of Physical Therapy. By Robert Shestack. New York: Springer Publishing Company, Inc., 1956. Pp. 212.

Proctology. By Harry E. Bacon, Stuart T. Ross and Porfirio Mayo Recio. Philadelphia and Montreal: The J. B. Lippincott Company, 1956. Pp. 441, with 228 illustrations and 5 color plates.

This text, addressed primarily to the busy physician, is the work of three distinguished Fellows of the International College of Surgeons. In a sense, it follows the plan of Dr. Bacon's manual, *Essentials of Proctology*, published in 1943, although it is somewhat larger and more comprehensive in its scope. All of the problems met in connection with the diagnosis and surgical treatment of diseases of the anorectum and colon are covered. As the authors state, however, it presents fundamentals of proctology shorn of historical data, extensive description of pathology, obsolete forms of examination and treatment and bibliography. Only in this way has it been possible to offer a concise, fluent and detailed exposition of the authors' experience and current practice. It is well illustrated and quite readable. The chapters on diverticular disease, malignant tumors of the anus, rectum and colon, and intestinal parasites are of special interest, revealing as they do the best of present ideas. This volume will prove a gratifying and needed addition to the library of every physician, specialist, surgeon or general practitioner who is interested in the subject.

CURTICE ROSSER, M.D.

The Treatment of Fractures: Vol. I. By Lorenz Bohler. Translated from the Thirteenth German Edition by Hans Tretter, Helen B. Luchini, Frank Kreuz, Otto A. Russe and Robert G. B. Bjornson. New York and London: Grune and Stratton, 1956. Pp. 1072, with 1721 illustrations.

For about ten years before World War II, surgeons from various countries, including the United States and Canada, traveled to Vienna in order to study the methods of Lorenz Bohler and his assistants. Most of these surgeons returned to their home countries and reported to their colleagues that the Unfallkrankenhaus, where Prof. Bohler and his assistants taught and energetically demonstrated the care of fractures and other injuries, was the Mecca to which all surgical pilgrims should go to learn traumatology. Professor Böhler, his assistant Ehalt and other members of his staff visited Chicago, where I was privileged to meet them. I visited their hospital in Vienna shortly before the outbreak of World War II. I was impressed by the large number of severely injured patients who were being treated, both by day and by night, as outpatients or inpatients, in the Accident Hospital in Vienna.

Volume I of the fifth English edition of Bohler's reference book is the first completely new edition in English since the translation by Hey-Groves more than twenty years ago. The English translation has been accomplished by the aid of a team of able translators. Professor Bohler gives Dr. Russe credit for a large part of the translation of Volume I, and for all of the translation of Volumes II and III, which are yet to appear as part of the fifth edition in English.

Volume I is divided into two parts. Part 1 is headed *General Considerations*. It contains a classification of fractures; a second on the complications and general principles of fracture treatment of recent open wounds and recent open fractures without sulfonamides or penicillin, and a section on the treatment of long-standing infected wounds and infected fractures without sulfonamides or penicillin. Prof. Bohler explains that there is still a shortage of antibiotics in Vienna, as in many other areas in the world. In the event of war the shortage would be still more acute. For that reason he reemphasizes the methods of effective care of fractures and of infections without the aid of these antibiotics. Twenty pages are devoted to a discussion of war surgery and special army hospitals.

Part 2 is entitled *Special Parts*. This includes the treatment of fractures of the skull; dislocations of the mandible; fractures and dislocations of the spine; ' iuries of the chest; closed abdominal inj force; open injuries to

to the urinary system; injuries to the rectum from pelvic fractures; injuries by impalement; fractures of the pelvis; dislocations of the pelvis; fractures of the clavicle; dislocations of the clavicle; fractures of the scapula, and fractures, dislocations or other injuries of the various components of the upper extremity. The last 90 pages of Volume I describe the treatment of fractures and other injuries of the hand and fingers.

Prof. Böhler states in the foreword to the fifth English edition that he has attempted to record in Volume I his experiences as Director of the Unfallkrankenhaus, which has registered 660,000 cases of injury treated there during the period from 1925 to 1955, with approximately 87,000 inpatients. Prof. Böhler also had a wide experience in the treatment of gunshot wounds of bones and joints during both World Wars.

The general principles of treatment, as outlined, are excellent. The specific technics used for certain types of fractures, however, would not be acceptable to many experienced orthopedic surgeons. Böhler still treats many fractures of the shaft of the humerus with abduction splints or shoulder and arm spica casts. The hanging cast, which has been widely used for fractures of the shaft of the humerus, is not discussed in the section dealing with fractures of the upper extremity.

Prof. Böhler expresses disapproval of intramedullary fixation as a general principle. He states that intramedullary fixation retards the formation of callus and hence delays union or promotes nonunion. This has not been the experience of most orthopedic surgeons in the United States. The surgeon who opens the site of a fracture, either recent or old, for the insertion of an intramedullary rod, or for any other type of internal fixation, has the opportunity of stimulating callus and new bone formation by applying multiple small bone grafts. Internal fixation by means of a slotted plate or intramedullary rod makes possible early motion of adjacent joints. This use of muscles not only promotes better circulation and better tonus but helps to maintain physiologic compression between the fracture fragments.

It was a disappointment to me to find Prof. Böhler recommending circular loops of malleable wire in the treatment of fractures of the long bones. The fact that he has succeeded in obtaining union of many oblique fractures treated by this method does not make the method one that can be accepted or recommended to students. More acceptable methods of treating these fractures are available. Many technics and methods discarded by other fracture surgeons ten or fifteen years ago are recommended in this volume. Some modern and widely approved technics are completely omitted, including the work of such important contributors as Charnley and Eggers, who showed the importance of physiologic compression between fracture fragments to promote healing.

EDWARD L. COMPERE, M.D.

Principles and Methods of Sterilization. By John J. Perkins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 340, with 174 illustrations.

There has long been a need for this type of book. In hospital institutions there are many professional and nonprofessional workers upon whom the science of sterilization and surgical asepsis depends. The author of this book, who is director of research for the American Sterilizer Company, has organized and systematized the study of sterilization in this book so that it is "meaty" and not voluminous.

Regardless of the equipment and/or process of sterilization concerned, the author covers the subject in such an organized, systematic method that it can be covered, referred to and digested easily and briefly. The excerpt by Alexis Carrel in the beginning of the book covers the principles and purposes of the manuscript. An excellent chapter deals with the planning and organization of a central supply. This book will be a welcome addition to the surgeon's armamentarium and of interest to operating room supervisors, central supply offices, laboratory technicians, small and large clinic staffs, pathologists, bacteriologists, directors of nursing, hospital administrators and maintenance engineers.

JEROME J. MOSES, M.D.

Clinical Laboratory Methods and Diagnosis By R B H Gradwohl St Louis The C V Mosby Company, 1956 5th ed 2 vol Pp 2452, with 765 illustrations and 52 color plates

This new edition of Gradwohl's classic on laboratory technics and diagnosis is a worthy successor to the previous editions The material is concentrated in two volumes, and every chapter has been brought up to date All of the latest knowledge and methods are included

Most of the chapters were, as usual, written by Dr Gradwohl himself The chapter on bacteriology was newly revised by Dr Oscar Felsenfeld The chapter on hepatic diseases has been enriched by a contribution from Dr Spellberg Dr G G Weinstein prepared a special section on body fluids and electrolytes The hematology chapter was supervised by Dr Harry Agress, and the chapter on medical mycology was written by Dr C W Emmons

There is no doubt that a work written with so much care by experts in every field is an outstanding achievement This reviewer enjoyed reading the book, which, in spite of the fact that it contains all the methods used in the laboratory, is lively and readable Needless to say, this book should have a place in every laboratory and in the library of every pathologist

WERNER F EISENSTAEDT, M D

Tuberculosis in Obstetrics and Gynecology By George Schaeffer Boston Little, Brown & Co, 1956 Pp 307, with 58 illustrations

This book is much needed, for it brings up to date all the monumental advances in the knowledge of tuberculosis as it is related to obstetrics and gynecology The author has had extensive experience and clearly portrays the modern methods of treating tuberculosis of the female genitalia

The work is extremely rich in description of the various methods of diagnosis An excellent portion is the section dealing with the prenatal antepartum period, labor, and postpartum care of the tuberculous pregnant patient Although the final answer as to the diagnosis and treatment of tuberculosis of the female genitalia has not been ascertained, the author, in a very lucid manner, presents all the information now available

The treatment and care of the tuberculous patient have changed remarkably in the past decade The author presents the entire subject in a readable manner The book should have inestimable value for the general practitioner as well as for the obstetrician and gynecologist Anyone who is interested in tuberculosis will find it a real gem

E A KANTER, M D

Klinische Funktionsdiagnostik By H Kuchmeister Stuttgart Georg Thieme Verlag, 1956 Pp 411, with 152 illustrations

This book represents an interesting attempt to summarize the available diagnostic means in order to observe normal or abnormal function of systems and organs It was a difficult undertaking, requiring the knowledge of an experienced clinician and an experienced clinical pathologist The author fulfills these conditions and reveals, in different chapters, his knowledge and experience in the field of laboratory and clinical diagnosis

Needless to say, a book like this is subjectively written and must therefore represent mainly the author's experiences The chapters on respiration, kidney diseases and hematology are written by the author's co-workers They are well adapted to the general tenor of the book

Although one might argue with the author as to the value of certain methods presented, one must admit that the book in general fulfills its purpose It is a book in which every clinician should be interested and which an experienced clinical pathologist would like to read

WERNER F EISENSTAEDT, M D

Plastic Repair of Genito Urinary Defects By George Bankoff New York Philosophical Library, 1956 Pp 345, with 86 illustrations

This book provides a guide to the nature of congenital and acquired genitourinary defects and their surgical repair The text is divided into three sections Part 1 deals with the embryologic and anato[illegible] of the genitourinary systems T[illegible] chapt[illegible]

and gives a complete review of the subject. Part 2 deals with malformations and plastic repair of the gentiourinary system in both sexes. Throughout this chapter the author has used specially drawn illustrations, showing the stages of the various technics employed. Many of these illustrations are excellent; a few, however, are difficult to follow. Short summations of different technics for similar plastic procedures are included.

The various operations could have been described more thoroughly, but, as the author suggests, the illustrations were used to clarify the procedure and reduce the amount of description in the text.

Part 3 deals with sterility and impotence in the male and in the female and briefly reviews the cause, effect and treatment.

Surgeons, both general and specially trained in the plastic repair of genitourinary defects, will find this book valuable for reference, in that the information desired is in one concise treatise.

BERNARD E. COHLER, M.D.

Cushing's life work culminated in his two thousandth operation for a brain tumour. There, in his own handwriting, was a note upon each of the two thousand done just after the operation, with microscope sections of the tumour itself, and the most complete records of the patient's progress. They were encouraged to write to him on each anniversary of the operation, and now he had a dossier of life stories going back twenty years. He catalogued these macabre histories with the same imposing care as he had given to his books, and now, looking back over his experience, he realized that he had been very much more confident about brain operations at the end of his first two years of working upon them than he was now after a quarter of a century. Yet knowledge had been gained, and this could be passed on via the Brain Tumour Registry. It was not merely an exercise in professional vanity. Harvey Cushing loved manuscripts and rare books, but this gathering of the proofs of his own surgical skill in the two thousand cases was his true library.

It is rare to find three such talents in one man: the merely manual craftsmanship which the surgeon needs in his daily work; the human insight which enabled Cushing to produce the Osler biography; and the cool curiosity of the man who collected two thousand brain specimens all patiently annotated in his own handwriting.

Abstracts from Current Literature

Analysis of Five-Year Survival in Carcinoma of the Rectum and Rectosigmoid. Mayo, C. W., and Fly, O. A., Surg., Gynec. & Obst. 1:94, 1956.

A comparison of the survival rates for 1,146 patients with carcinoma of the rectum and rectosigmoid treated by anterior resection, by one-stage combined abdominoperineal resection or by posterior resection is presented. The influence of metastasis to the regional lymph nodes, of the grade of malignancy of the lesion, of its proctoscopic level and of its location in relation to the peritoneal reflection is analyzed, and a comparison made of the three operative procedures.

The results of these survival studies in the "controversial groups," i.e., patients whose lesions are located between 6 and 15 cm. from the dentate margin, indicate that a sphincter-preserving procedure, such as anterior resection, is as curative as is one-stage combined abdominoperineal resection or two-stage posterior resection.

The level of the lesion in relation to the peritoneal reflection has little influence on the survival rates.

WILLIAM E. NORTH, M.D.

Mass Screening Techniques for Cancer of the Cervix. Oppenheim, A.; Rosenthal, T., and Modin, M. C., J.A.M.A. 161:1067, 1956.

If early diagnosis and effective therapy of carcinoma are to be achieved, screening technics must be developed that can be applied to large groups of the population.

With these views in mind, and in an effort to parallel the self-examination program for mammary carcinoma, methods of obtaining vaginal secretions by the patient herself were developed.

The dry smear technic is utilized. The patient prepares a slide by streaking it with an applicator. She then separates the lips of the vagina and inserts the prepared swab gently into the vagina, rolling it from side to side several times.

This method has met with good cooperation on the part of the patient.

EDMUND LISSACK, M.D.

Results of Subtotal Gastric Resection (Billroth II Type) for Duodenal Ulcer. Roth, J. L. A.; Becker, I.; Vine, S., and Bockus, H. L., J.A.M.A. 1:794, 1956.

Correlation of postoperative with preoperative acidity and the extent of gastric resection in 100 patients on whom the Billroth II type of subtotal gastric resection was performed for duodenal ulcer has led to the following conclusions:

1. The higher the preoperative level of free acid, the greater the likelihood of increased postoperative acidity. Fifty per cent of the patients with preoperative "hyperacidity" had acid after the operation. Only 13 per cent of patients with normal preoperative acid levels showed acid after the operation.

2. The less extensive the resection, the greater the likelihood of a higher postoperative free acid titer. Sixty-four per cent of patients with hyperacidity before a resection of two-thirds of the stomach had more than 10 clinical units of free acid postoperatively, whereas only 21 per cent of the group with hyperacidity before a gastric resection of three-fourths or more had more than 10 units of hydrochloric acid postoperatively.

3. The higher the preoperative acidity, the greater the necessity for a more extensive resection to achieve a lower postoperative acid level.

4. The higher the postoperative acidity, the greater the likelihood that anastomotic ulcer will develop. Anastomotic ulcer occurred in 4 of 30 patients who underwent the less extensive resections [illegible] one of the 70 patients who underwent resection of at

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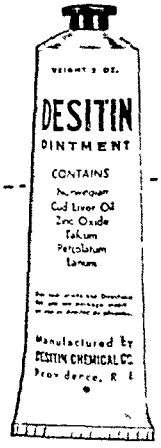

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General Surgery

Gastric Resection as Indicated for Conditions Other than Ulcer and Carcinoma

EURICO BRANCO RIBEIRO, M.D, F.C.B.C, F.A C S, F.I.C S*

SAO PAULO, BRAZIL

NOWADAYS, the original meaning of the term "gastric surgery" has become almost identified with that of gastric resection. Other gastric surgical procedures have either been discontinued or are utilized rarely and in specific cases only. Even gastroenterostomy, which was extremely popular thirty years ago, has been abandoned in the main medical centers. Gastrectomy, in fact, has taken over its sole remaining indication, i.e., acute perforation into the open peritoneum, for which gastroenterostomy was formerly combined with simple suture of the perforated area.

Attempted establishment of gastroenterostomy as a necessary surgical complement of vagotomy also failed. This operation has passed the phase of popularity peculiar to new methods supported by surgeons of repute; it has not survived the test of time.

Although I recognize ulcer and carcinoma as the two main indications for gastric surgical intervention, I shall deal in this presentation, on the basis of twenty-five years' experience in surgical treatment of the stomach, with other conditions that call for gastric rese ring the aforementioned perio this operation in al or

*President of the Brazilian Section, International College of Surgeons, and Director, Sao Lucas Sanatorium, Sao Paulo

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ulcer in 1,846, for carcinoma in 184 and for other conditions in 181.

Gastric resection is generally employed for benign tumors of the stomach and for metaplastic formations, e.g., the aberrant pancreas. For these, the logical therapy would be simple removal of the tumor after gastrotomy. It is difficult, however, to ascertain beforehand that a tumor of the stomach is benign. Roentgen study, as a rule, does not reveal its nature, and even when a polyp is suggested there remains the possibility of malignant change. The complaints that lead to the roentgen examination, moreover, are usually sufficient in themselves to justify a radical operation. The microscopic diagnosis of cytologic elements obtained from the stomach through a Levine tube can supply conclusive evidence only when typical carcinomatous cells are revealed thereby. Negative results from such an examination, therefore, do not justify a conservative approach, and the same can be said of biopsy or frozen section.

Gastroscopic study is a propedeutic measure of limited use, not particularly well liked by patients and doubtful as to its soundness, since many parts of the stomach cannot be reached by the gastroscope. It does not provide the assurance that the examiner can expect from a direct view of the lesion.

It is for these reasons that benign tumors are treated by gastric resection and that surgeons are in full accord as to its justification.

One of the conditions that eventually calls for resection is ulcerative gastritis. It may be argued that this term means nothing more than multiple ulcers of the stomach; but, although in a general sense this may be true, the problem is altered when one analyzes it from the clinical and therapeutic points of view. The symptoms of ulcerative gastritis do not recede as readily as do gastric and duodenal ulcers in response to adequate therapy and suitable dietary adjustments. The patient begins his journey in the physician's office, obtaining no more than temporary improvement. In almost all cases the symptoms are those of ulcer. Semiologic tests directed to neighboring organs (liver, pancreas, kidneys, intestines) give completely negative results, confirming the impression that the trouble is typically and exclusively gastric. Owing to the failure of the various clinical methods, it soon becomes obvious that the only solution lies in surgical intervention, i.e., gastric resection, preceded by a verifying gastrotomy if the diagnosis has not yet been confirmed by gastroscopic study.

In some instances the classic symptoms of ulcer are present when all tests give completely negative results and even surgical investigation reveals nothing, not even gastritis. Faced with the problem of classifying such cases within the known boundaries of gastric disease, certain authors, principally Spanish authors, coined the odd term "ulcus sine ulcere," making use of Latin to mask their actual ignorance of the nature of the condition. Their firm advice, however, is that once the clinical diagnosis has been established in a case in which there is a "typical ulcer story" cure is possible only by gastric resection.

Faced with the absence of anatomopathologic signs in the stomach, one may consider certain recognizable alternatives, such as those consequent on an inflammatory process. Gastritis is common; in general it responds to medical treatment. Sometimes, however, it progresses to the point of no return (hypertrophic gastritis, polypoid gastritis and the "etat mamelonee"). It is sometimes difficult to obtain recession of the symptoms, and the physician may be forced to refer his patient to a surgeon. In such circumstances gastric resection, as advocated by Eirian Williams, is the solution.

In some cases the gastric mucosa undergoes no significant inflammatory change but becomes hypertrophied in the antral region, spreads over the muscles and crosses the pyloric ring It is easy to foresee the inconveniences, sometimes intense, that may arise from this condition The consequent morbid state has been called "prolapse of the gastric mucosa into the duodenum" This is a new illness, only recently introduced into the field of gastric pathology The roentgen signs have already been established, and among specialists the entity is accepted as beyond doubt Medical treatment is not always effective, and the patient must seek a surgeon for a healing resection Simple removal of the redundant mucosa could be tried, with adjustment of the remainder to the dimensions of the muscles that support it, this, however, would call for a major exposure of the stomach, with possible compromise of irrigation and the expansion of undesirable scars On the basis of current knowledge, the safest method is gastric resection

Areas of acute erosion resulting in hemorrhage, sometimes of great volume, constitute another indication for resection The surgeon finds the intestine and the stomach full of blood and cannot perceive any signs of an ulcerous lesion in the walls of either Gastrotomy rarely helps him in his search for the bleeding point He is then obliged to decide for gastrectomy, and he sometimes discovers in the extirpated specimen the cause of the hemorrhage—a vessel gaping or obstructed by a small clot in the floor of an unretained ulcer or an area of simple erosion If nothing of the sort is present he decides in favor of a "panel hemorrhage", but, even without having discovered the cause of the bleeding, he has nonetheless saved his patient's life by performing resection

Cooper and Ferguson of Philadelphia published a study encouraging resection in the presence of hemorrhage of undetermined origin from the higher segments of the gastrointestinal tract They reported that failure to perform the so called blind gastrectomy on 1 patient caused his death, and autopsy revealed the lesion as one amenable to resection

Harry Bockus, at the Atlantic City Congress of the American Medical Association in June 1955, presented a case in which the patient, who had already undergone operation for carcinoma of the ascending portion of the colon, had had several postoperative attacks of hematemesis and melena and had been given sixty one blood transfusions in thirty five days in a desperate struggle between life and death Autopsy revealed nothing more than erosion of the stomach Gastric resection would have saved this patient's life

A rare condition that affects both interior layers of the stomach and may require gastric resection is cicatricial stenosis caused by caustics, as described by Bosch del Marco in 1946 The same applies to prepyloric stenosis consequent upon an ulcerus scar Conveyed from the mucus to the muscular layer of the stomach are two distinct pathologic alterations (a) distention of the stomach with atony and (b) hypertrophy of the gastric musculature

The first of these is called, adequately or inadequately, gastroptosis, dolichogastria, megagastric atony or, better, gastric hypotonia It is a condition that may have rather serious consequences, the stomach does not empty itself within the normal time, retaining part of the ingested food, which is transformed into a focus of intoxicating *fermentation, with decided* repercussions on the nervous system An appropriate girdle, an adequate diet, a moderate way of living and suitable medication often relieve and even eliminate the suffering caused by this condition There are many cases, however, in which all

these means fail, and the patient, in the agony of trying to empty his stomach, resorts to forced vomiting for a few hours of relief. In such cases gastric resection is strongly advisable. In many instances the end results are excellent, though the effect on the general health, and especially on the nervous system, is so serious that a long period may be required for the patient to appreciate the genuinely good effect of the operation. In still other cases the services of a psychiatrist may be required to reorient him.

Hypertrophy of the gastric musculature may also demand gastric resection. As is well known, the so-called hypertrophic pyloric stenosis of the newborn is common, but its cure, although surgical, is generally accomplished by simple section of the muscular fibers according to Rammstedt and Fredet. This remedy does not apply, however, to hypertrophic pyloric stenosis in the adult, which calls for gastric resection.

The name that designates this condition apparently leads many authors to identify it with that observed in the child. Since to many it appears to be a separate entity, the term does not satisfy those who wish to denominate it accurately. Neither does the term "achalasia" (failure to relax), or permanent hypertonia, since this word would be applicable only to the sphincters. Now the muscular hypotonia associated with this disease is not referable to the muscle of the pyloric orifice; it is caused by the fibers that surround and restrict the gastric area known as the pyloric antrum. For this reason, in 1934, I proposed for this morbid state the name "ringlike hypertrophy of the musculature of the pyloric antrum." This designation is perhaps a little long, but it is clearly expressive, since the hypertrophy appears throughout the extension of the muscular fibers in this region.

This condition causes permanent narrowing of the lumen of the distal portion of the stomach, which remains rigid on roentgen examination, the wall of the antrum often being mistaken for the pyloric sphincter, which is prolapsed inward, inside the duodenal cavity. This peculiar roentgen image is known as the sign of Kirklin.

The tumor formed by ringlike hypertrophy of the musculature of the pyloric antrum simulates carcinoma on roentgen examination and even under the direct view of the surgeon at the operating table. Sometimes the two diseases occur simultaneously, as I recently had the opportunity to observe. Such a case has also been observed at the Mayo Clinic. It is more common, however, to detect ulcer in association with this form of hypertrophy. Kirklin and Harris demonstrated this combination in 29 of 81 cases. The hypertrophic lesion pure and simple, with no associated pathologic change, was present in 31 of 81 cases recorded at the Mayo Clinic.

My own experience has included cases of the simple condition, but its association with other conditions, especially ulcer, has been more frequent. The associated lesion may occur either at the site of the hypertrophy or at a distance. Of 33 cases, I encountered pure hypertrophy in 11.

Ringlike hypertrophy of the type under discussion is irreversible, as the case to be presented will demonstrate. In this instance the roentgen image of the lesion had appeared in a film taken fifteen years earlier. The solution is surgical intervention, in the form of gastric resection.

Even outside the field of gastric disease there are indications for gastric resection. I refer to two specific syndromes: diverticulum of the duodenum and the sequelae of cholecystectomy. For either of these, strange though it may seem, gastrectomy may be advisable.

Diverticulum of the duodenum is a common anomaly. It may produce acute

clinical symptoms in addition to diverticulitis and perforation. It is a focus of retention of food and thus favors harmful fermentation. I have never encountered diverticulitis of the duodenum, though I have had patients who showed some symptoms. In a single instance I encountered a diverticulum inside the fourth portion of the duodenum; there were none elsewhere. A good portion of barium had been taken the day before for the purpose of roentgen examination.

Some authors consider an operation necessary whenever the roentgen image produced by the opaque medium persists for more than twelve hours. My experience has taught me that simple removal of the diverticulum, according to the advice of the classic authors, generally does not clear up the clinical symptoms; the patient continues to complain and often presents symptoms resembling those of duodenal ulcer. Also, the removal of a single diverticulum of the second portion, usually located beside the ampulla of Vater, offers certain technical difficulties and is not free of hazards. It was mainly the clinical failure of diverticulectomy, however, that led me to try in such cases to accomplish deviation of the transit of food by means of the Polya gastric resection. With this I obtained a completely satisfactory result and was delighted to learn that some other modern authors had adopted the same method after having encountered, doubtless, the same unsatisfactory results. Waugh and Johnston of Rochester confirmed the fact that fewer than half of the patients obtain the expected results from diverticulectomy. Gastroenterostomy, once attempted by the same authors, also failed to serve the purpose. Thus far, only gastric resection has given relief to the symptoms of patients with duodenal diverticula. For all these reasons, subtotal gastrectomy has been used by Lockwood, Fulder and others. Cattell and Mudge performed gastric resection in a case of diverticulitis.

Supported by the opinions of these authors, I consider myself justified in continuing to recommend simple gastrectomy, since I have long employed it for symptomatic diverticulum of the duodenum, leaving the diverticulum itself without manipulation.

There remains for consideration the indication defended by Arnaldo Yodice at the Fourth Pan American Congress of Gastroenterology, held in São Paulo in 1954. The Argentine author presented the first results of the technic he had recently adopted in dealing with the digestive sequelae of cholecystectomy. Each of his patients had undergone removal of a gallbladder with stones or, more frequently, a gallbladder prone to chronic inflammation. All continued to suffer from chronic indigestion, pain in the right hypochondrium, migraine, hyperchlorhydria, vomiting, etc.

Distribution of Indications for Gastric Resection Performed for Conditions Other Than Ulcer and Carcinoma in 181 Cases

Gastric benign tumor		4
Neurofibroma	1	
Fibroma	1	
Aberrant pancreas	1	
Intestinal metaplasia	1	
Ringlike hypertrophy of the musculature of the pyloric antrum		33
Dolichogastria and gastric ptosis		67
Gastritis		57
Simple	23	
Ulcerative	28	
Hemorrhagic	3	
Polypoid	2	
Mamelonous	1	
Pyloric conditions		4
Prepyloric stenosis	2	
Pyloric achalasia	1	
Prolapse of mucosa into duodenum	1	
"Ulcus sine ulcere"		2
Duodenal conditions		11
Diverticulum	11	
Periduodenitis	2	
Constrictive duodenitis	1	
Total		181

Roentgen examination revealed that nothing was retained in the stomach, and there was no lithiasis of the common duct. Papillotomy was done in an attempt to correct the biliary dyskinesia. Gastric resection, in Yodice's opinion, clears up the symptoms. No doubt this is audaciously conceived as an indication for gastrectomy, but time will reveal its appropriateness. The enthusiasm of a single author is never sufficient to justify recommending a method; its rationale must pass through the sieve of many an observant mind before this becomes feasible. For the moment, therefore, I shall limit myself to simple mention of the opinion of a surgeon of prestige who deserves al' consideration.

SUMMARY

Gastric resection may be strongly indicated for several lesions besides ulcer and carcinoma. Ulcerative gastritis and erosion hemorrhages offer grounds of transition between the ulcer and other nontumorous lesions of the stomach, as do polypoid gastritis and the etat mamelonee between carcinoma and benign gastric tumor. Cicatricial stenosis of the pyloric antrum due to caustics is an occasional but rare indication for gastrectomy. The stenosis not only involves the mucosal layer but affects the muscular stratum, in which other lesions may be harbored. Ringlike hypertrophy, like gastric ptosis, means hypertrophy in width as well as in length, and these are two conditions for which gastrectomy can be performed.

Entirely outside the stomach, two conditions may occur which are seldom recognized as indications for gastrectomy, namely, diverticulum of the duodenum and the digestive sequelae of cholecystectomy. To these may be added the "ulcus sine ulcere" of the Spaniards. It is possible that there are still other indications, but it is with regard to these that the author reports his experience.

SUMARIO

A ressecção gástrica pode ser fortemente indicada para diversas lesões além da úlcera e do carcinoma. A gastrite ulcerosa e hemorragias de erosão oferecem campos de transição entre a úlcera e outras lesões não tumorais do estômago, conforme o fazem a gastrite polipoide e os mamelonas entre o carcinoma e o tumor gástrico benigno. A estenose cicatricial do antro pilórico devido a cáusticos é uma indicação ocasional porém rara para a gastrectomia. A estenose não sòmente involve a camada mucosal mas afeta a camada muscular, no qual outras lesões podem se alojar. Hipertrofia designada como ptose gástrica, significa hipertrofia em largura como também em comprimento.

Há duas condições que podem ocorrer inteiramente fora do estômago, e que raramente são reconhecidas como indicações para a gastrectomia, isto é, divertículo do duodeno e sequelas digestivas da colecistectomia. A êssas pode se acrescentar a "ulcus sine ulcere" dos espanhois. É possível que haja ainda outras indicações, mas é em relação a essas que o autor relata sua experiência.

RIASSUNTO

La resezione gastrica può essere indicata in molte lesioni, oltre l'ulcera e il carcinoma. La gastrite ulcerosa e l'erosione emorragica sono, infatti, un terreno di transizione fra ulcera e lesioni non cancerose dello stomaco, così come la gastrite polipoide e lo stato mammellonato. La stenosi cicatriziale dell'antro pilorico, dovuta a caustici, è un'altra indicazione, benchè rara, per la gastrectomia. La stenosi non involve solo la mucosa ma anche lo strato muscolare su cui altre lesioni possono svilupparsi. L'ipertrofia ad anello, detta ptosi gastrica, è una ipertrofia che si estende tant in larghezza che in lunghezza.

Completamente al di fuori dello stomaco

due sono le condizioni per una gastrectomia, e cioè il diverticolo del duodeno e i postumi della colecistectomia. A queste si può aggiungere anche "l'ulcus sine ulcere" di Spaniards.

E' possibile vi siano ancora altre indicazioni, ma è solo in rapporto a quelle sunnominate che l'autore ha basato la sua esperienza.

ZUSAMMENFASSUNG

Es gibt ausser dem Magengeschwur und dem Krebs noch einige andere Krankheitszustande, die eine starke Indikation zur Magenresektion abgeben konnen. Die geschwurige Gastritis und Magenblutungen von Erosionen konnen die Basis zum Übergang zwischen Geschwur und anderen nicht geschwulstartigen Magenerkrankungen abgeben, ebenso wie die polypoide Magenentzundung und der "état mamelonné" eine Zwischenstufe zwischen gutartiger Magengeschwulst und Krebs bilden konnen. Die narbige Verengung des Magenvorhofs als Folge von Veratzungen stellt manchmal, wenn auch selten, eine Indikation zur Magenresektion dar. Die Verengung ist nicht auf die Schleimhaut beschrankt sondern betrifft auch die Muskelschicht, die weitere Veranderungen beherbergen mag. Unter der als Magensenkung bezeichneten ringformigen Hypertrophie versteht man eine Hypertrophie in der Weite sowohl als in der Lange.

Zwei Krankheiszustande, die nur selten als Indikation zur Magenresektion anerkannt werden, liegen vollig ausserhalb des Magens, namlich das Divertikel des Zwolffingerdarms und die als Folge einer Gallenblasenresektion auftretenden Verdauungsstorungen. Ferner mag das "ulcus sine ulcere" der Spanier erwahnt werden. Der Verfasser beschrankt seinen Bericht auf seine Erfahrungen mit den erwahnten Krankheitszustanden, ohne auszuschliessen, dass es moglicherweise noch weitere Indikationen zur Magenresektion gibt.

RÉSUMÉ

La résection gastrique peut être indiquée dans plusieurs affections en dehors de l'ulcère et du carcinome. La gastrite ulcéreuse et les hémorragies offrent des terrains de transition entre l'ulcère et d'autres lésions gastriques non tumorales, comme les polypeset l'état mamelonné entre le carcinome et la tumeur gastrique bénigne. La sténose cicatricielle de l'antre pylorique provoquée par des agents caustiques et une indication rare de la gastrectomie. La sténose n'englobe pas seulement le niveau muqueux mais affecte aussi le stratum musculaire dans lequel peuvent être localisées d'autres lésions. L'hypertrophie "en anneaux" désignée comme ptose gastrique, est une hypertrophie aussi bien en largeur qu'en longueur. En dehors de l'estomac, deux états peuvent se produire qui sont rarement reconnus comme indication de la gastrectomie, à savoir le diverticule du duodénum et les séquelles digestives de la cholécystectomie, auxquelles l'on peut ajouter l' "ulcus sine ulcere" des Espagnols. Il est possible qu'il y ait encore d'autres indications, mais ce sont ces cas qui font l'objet du rapport de l'auteur.

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Bathing is beneficial to most patients, but the benefit is not always lasting. Sometimes it must be used less than one otherwise would owing to the patient's lack of adequate facilities. There are not many houses where the necessary equipment and servants of the right kind are available. A bath can do no little harm if it is not taken in the right way. A sheltered spot free from smoke is needed, and plenty of water. Baths should be frequent but not excessively so unless there is some special reason. It is better not to be rubbed with soap, but if soap-mixture be used it should be warm and added to the water in far larger quantities than is usually the case and a further generous quantity should be added later and more soon afterwards. The patient should not have far to go to the bath-tub and it should be easy to get in and out of it. The bather should be quiet and orderly and should do nothing for himself; others should pour the water and rub him. A large quantity of tepid water should be prepared and it should quickly be poured over the bather. Sponges are better than scrapers and the body should not be allowed to get too dry before it is anointed. The head however should be dried as well as possible by wiping it with a sponge. Do not allow the extremities, the head and the rest of the body. to become chilled. Do not bathe shortly after food or drink, and do not eat or drink shortly after a bath.

The decision whether to bathe or not should rest largely with the patient if he is particularly fond of his bath and accustomed to it. Such people are more eager for it and derive benefit from bathing and suffer harm from abstaining.

—*Hippocrates*

Rehabilitation in All Its Phases

ROSS T. McINTIRE, M.D., F.A.C.S., F.I.C.S.
CHICAGO, ILLINOIS

REHABILITATION, a term that is widely used today, in my judgment is not well understood by either the medical profession or the laity. Rehabilitation simply means the restoration of a person or a part to its former useful function. When one considers what this means, it can take in a tremendous field.

Citizens of the United States are initially engaged in establishing a rehabilitation program that will conserve human resources. There are some 28,000,000 persons in this country who have some sort of physical handicap that keeps them from pursuing a normal existence. When one considers that the total population is less than 170,000,000, this is a large percentage that must turn for assistance to government, for training to fit them for employment.

For a great many years little was done in our country in the field of rehabilitation. World War I, with its appalling number of casualties, brought the need for this service into clear focus. Because so little had been done in this field, there was no organization able to take over this work and perform the various services that are necessary to restore a physically handicapped person to a state in which he can support himself. The experience of the Veterans Administration in rehabilitation of the paraplegic patient after World War I is a glaring example.

One of our great needs in the United States today is to determine the number of citizens who require rehabilitation. It is obvious that the man or woman who is damaged by war requires medical and hospital rehabilitation, followed by some sort of vocational training. This does not take into consideration, however, the very great number of men, women and children who are damaged yearly by accidents on the highway, in industry, on the farm, and even in the home. These figures are staggering when added up. Then, too, physical disability due to disease plays an enormous part in the demand for rehabilitation.

The American Heart Association insists that there are 10,000,000 persons suffering from heart disease of one sort or another. This great group falls into the category of persons with a hidden handicap. The same holds true for those who are epileptic. A large group is afflicted with muscular disorders, cerebral palsy and many other diseases. Add to all of this the damaging effect following polio. All in all, these groups make up the 28,000,000 handicapped persons.

There is one group that I have not mentioned, that of citizens over 65 years of age. One might argue that these are not physically handicapped persons, but the aging process is as damaging to health and physical activity as are any of the chronic diseases of the young. At the present it is known that there are some 15,000,000 persons over the age of 65. Of these, less than 1,500,000 are working. The problem of rehabilitation here is to determine how many of those above the age of 65 could work if given the opportunity and if properly placed as to their abilities.

It is predicted by the bure
that by the year 2 e

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will have nearly 100,000,000 more citizens than it has today. With the present increase in longevity, if the present practice of not employing the older citizen is continued, there will be one unemployed person for every one who is working. It is easy to see that this would be an impossible situation and one that must be planned for many decades in advance.

This problem is being recognized to some extent; the government is granting large sums of money for research into disabling diseases. It is to be hoped that the way will be found to prevent the various crippling diseases, for it is only by prevention that the problem of the physically handicapped will ever be solved.

To illuminate the difficulties now facing our country: Last year nearly 100,000 persons were so badly damaged by accidents on our highways that they will always be physically handicapped. Without rehabilitation and retraining they will never be able to work again. Some 150,000 others were injured in accidents in the home, on the farm and in the factories, and they, too, will require rehabilitation and retraining in order that they may find work again. This does not take into account any of those who are afflicted with the various diseases that affect the muscles by paralysis or as a result of the same.

The government, recognizing its responsibility to the damaged servicemen and women, has established excellent rehabilitation centers in the Veterans Administration, so that the men who have been injured in war reap the benefit of of a well developed rehabilitation service. The average citizen, however, does not fare so well, for his only source of rehabilitation after disease or physical damage is the vocational rehabilitation services of the state. These are subsidized in part by the federal government, with further assistance from the state government.

Last year, fewer than 60,000 men and women were rehabilitated by this means. This service, which should be considered a functional rehabilitation service, does not include some of the medical and surgical treatment that may be necessary. There were more than 250,000 applications for rehabilitation last year, and only 60,000 of the applicants were able to take advantage of the service, owing to the lack of money and facilities. Add to this a backlog of the 250,000,000 who have been brought up over the years, and the problem begins to assume its true proportions.

It is always easy to pass the responsibility on to the government, and it is true that, when the citizen cannot help himself, the government must aid him in some way. One well-known way is community welfare service. In the old days the county poorhouse served. The latter is certainly not desirable; neither can the welfare service assume too much of the burden. Since the physically handicapped citizen who requires rehabilitation is a part of some community, it would seem that each city of size should have its own rehabilitation center. This center should be provided by funds mainly derived from voluntary contributions and from service organizations. There are many communities that have done just this. Unfortunately they are all too few.

Portland, Oregon, has an excellent rehabilitation center, supported completely by voluntary agencies and service organizations. It does have another source of income, and that is the part paid by the state for the service it renders in rehabilitating physically handicapped citizens who are referred there under contract by the functional rehabilitation service of the state. In the entire Pacific Northwest, however, this is the only center. It cannot, under any circumstances, accept the cases that the various states wish to refer to it.

There are a number of other cities which recognize their responsibility to the handicapped There is another motive for rehabilitating the physically handicapped person, and that is to take him off the social service rolls and make him a taxpayer by giving him rehabilitation and training

Three years ago the city of Buffalo, New York, determined to conduct an experiment in this field A careful survey was made of physically handicapped men and women working in the plants, in stores and shops and in municipal capacities Of these, 5,100 were selected for the experiment At the expense of the city, the workers in this large group were given the necessary rehabilitation, whether it was surgical or in the field of corrective therapy — the necessary measures that would make them fully employable in a job for which they had aptitude and skill

The average monthly wage of this group before rehabilitation and retraining was $181 per month After rehabilitation, which was carried out over a year's time, members of the group were rehired on the basis of ability Many were reemployed in the plants in which they had previously worked Their average monthly pay was now $311 a month—an increase of more than 70 per cent in take-home pay This, the city of Buffalo proved, was "Good Business"

What is the responsibility then, as far as the doctor of medicine is concerned? His responsibility is not a mandatory one, but it certainly is a moral one I am convinced that any doctor of medicine will agree that preventive medicine is the most important phase of practice today

SUMMARY

Rehabilitation, a word used freely today but not always with understanding of all its implications, means the restoration of a person or part to the original useful function When one considers what this actually includes, one realizes that a tremendous field of effort is involved

In the United States, of a total of something less than 170,000,000 of population, there are approximately 28,000,000 physically handicapped persons—a rather large percentage These include persons with paraplegia, epilepsy, cardiac disease, muscular diseases (e g , myasthenia gravis), cerebral palsy, multiple sclerosis, war injuries, motor injuries, and simple senility With the expected increase of the population by nearly 100,000,000, the plight of aged persons could become desperate beyond the point of alleviation

Large sums of money are being allocated by the Federal Government for research into the cause and prevention of crippling diseases The problems of one segment of the handicapped population, that which enjoys the benefits provided by the Veterans Administration, are competently handled, but the average citizen has no such recourse, and the assistance provided by the government, Federal and state, is limited

The author suggests that every community establish its own rehabilitation center, supported by funds derived from voluntary contributions and service organizations He appeals to physicians and surgeons, who are best acquainted with the value of preventive action, to lend their influence toward the establishment of adequate programs of rehabilitation

RIASSUNTO

La riabilitazione, parola usata oggi liberamente ma non sempre nel suo pieno significato, è il ripristino di una persona o di una parte alla sua primitiva ed usuale funzione Una volta assimilato bene questo concetto si puo capire qu mpo di sforzi esso comporta

Negli Stati" u

170.000.000 di popolazione, si hanno 28.000.000 di persone con menomazioni fisiche. Persone paraplegiche, epilettiche, con malattie cardiache e muscolari (miastenie gravi), con paralisi cerebrali, con sclerosi multiple oltre ai feriti di guerra e di investimenti e alla semplice senilità. Con l'aumento previsto della popolazione la piaga delle persone anziane diviene disperata dal punto di vista dell'assistenza.

Ingenti somme di danaro sono state stanziate dal Governo Federale per la ricerca delle cause e per la prevenzione delle malattie inabilitanti.

Parte della popolazione menomata è sovvenzionata dalla Amministrazione Veterani, ma la media dei cittadini non ha questa risorsa e l'assistenza fornita dal Governo, Federale e di Stato, è limitata.

L'Autore suggerisce che in ogni comunità si stabilisca un proprio centro di riabilitazione sostenuto finanziariamente da fondi privati e pubblici. Egli si appella inoltre a medici e chirurghi perchè esplichino la propria attività e autorità nel propugnare questo programma di riabilitazione.

ZUSAMMENFASSUNG

Unter Rehabilitierung, einem Wort, das heute grosszügig wenn auch nicht immer mit Kenntnis seiner vollen Bedeutung gebraucht wird, verstehen wir die Wiederherstellung einer Person oder eines Körperteils zu der ursprünglichen nützlichen Ausübung der Funktion. Wenn man sich den weiten Umfang dieses Begriffes vor Augen führt, erkennt man, welche gewaltigen Bemühungen dieses Gebiet einschliesst.

In den Vereinigten Staaten gibt es unter einer Gesamtbevölkerung von etwas unter 170 Millionen etwa 28 Millionen körperlich behinderte Personen—ein ziemlich hoher Prozentsatz. Dazu gehören Menschen mit Lähmungen, Epilepsie, Herzkrankheiten, Muskelleiden (z.B.Myasthenia gravis), Gehirnlähmung, multipler Sklerose, Kriegsverletzungen, Automobilverletzungen und einfacher Senilität. Mit einem erwarteten Anwachsen der Bevölkerung um fast 100 Millionen könnte die traurige Lage der alten Leute einen verzweifelten Grad erreichen, der jenseits aller Möglichkeiten der Linderung liegt.

Die Bundersregierung stellt grosse Geldsummen zur Erforschung der Ursache und der Verhütung verkrüppelnder Krankheiten zur Verfügung. Eine Gruppe der an verkrüppelnden Krankheiten Leidenden ist gut und fachmännisch versorgt, nämlich diejenigen, die unter die Verwaltung der Veteranenfürsorge fallen; der gewöhnliche Bürger aber hat keine solche Zufluchtsstätte, und die von der Bundes- oder Staatsregierung gebotene Hilfe ist beschränkt.

Der Verfasser schlägt vor, dass jede Gemeinde ein eigenes Rehabilitierungszentrum einrichtet, das durch private freiwillige Stiftungen und von Hilfsorganisationen finanziert wird. Er wendet sich an die Ärzte und Chirurgen, denen der Wert vorbeugender Aktionen am besten bekannt ist, mit der Aufforderung, ihren Einfluss auf die Schaffung geeigneter Rehabilitierungsprogramme geltend zu machen.

SUMARIO

Rehabilitação, uma palavra livremente usada hoje em dia, mas nem semre com compreensão de tôdas as sous significações, significa a restauração de uma pessoa ou coisa a usa função original. Quando se considera o que isso implica na realidade, compreende-se o campo enorme de esforço que envolve.

Nos Estados Unidos, em um total de pouco menos de 170,000,000 da população, há aproximadamente 23,000,000 de pessoas com "handicapps" físcios—uma porcentagem bastante grande. Nelas estão

incluídas pessoas com paraplegia, epilepsia, moléstia cardíaca, doenças musculares (por exemplo, "myesthenia gravis"), paralisia cerebral, múltiplas lesão de guerra escleróticas, lesões motóres, e simples senilidade. Com o aumento esperado da população de perto de 100,000,000 a condição das pessoas idosas poderia se tornar desesperada além do ponto de alívio.

Grandes somas de dinheiro estão sendo empregadas pelo Govêrno Federal para pesquiza da causa e prevenção de moléstias de aleijão. Os problemas de um segmeno da população previlegiada, a que goza do benefício proporcionado pela Administração de Veterenos, estão completamente cuidados, mas o cidadão médio não tem tal recurso, e a assistência dada pelo govêrno, Federal e do estado, é limitada.

O autor sugere que cada comunidade estabeleça seu próprio centro de rehabilitação, financiada por fundos derivados de contribuições voluntárias e organizaçoes de serviço. Ele faz um apêlo aos médicos e cirurgiões, que melhor se acham ao par do valor da ação preventiva, para que exerçam sua influência para o estabelecimento de programas adequados de rehabilitação.

RÉSUMÉ

Le terme de réhabilitation, couramment utilisé aujourd'hui sans que soit toujours bien compris tout ce qu'il implique, signifie la récupération de tout ou partie des fonctions physiologiques d'un individu, ce qui comprend un champ d'efforts considérable.

Aux Etats-Unis, sur une population de près de 170.000.000 d'habitants, 28.000.000 *environ sont physiquement handicapés*, ce qui représente un pourcentage élevé. Ce chiffre inclut les cas de paraplégie, d'épilepsie, d'affections cardiaques, musculaires (par exemple la myasthénie grave pseudo-paralytique), la paralysie cérébrale, la sclérose multiple, les blessures de guerre, les lésions motrices et la sénilité simple. Avec une augmentation prévue d'environ 100.000.000 habitants, les infirmités des vieillards pourraient atteindre un degré alarmant quant aux possibilités de les soulager.

Des sommes importantes sont allouées par le Gouvernement fédéral pour l'étude des causes et de la prévention des infirmités. La Veterans Administration prend soin avec une grande compétence des problèmes d'une partie des êtres physiquement handicapés, mais la moyenne des citoyens n'est pas au bénéfice des bienfaits de cette organisation, et l'aide apportée tant par les différents Etats que par le Gouvernement fédéral est limitée.

L'auteur suggère que chaque communauté *établisse son propre centre de réhabilitation*, alimenté par des dons et des services de volontaires. Il demande aux médecins et aux chirurgiens, qui connaissent mieux que personne la valeur d'une action préventive, d'encourager par leur influence l'établissement de programmes de réhabilitation adéquats.

A man of action, forced into a state of thought, is unhappy until he can get out of it.

—*Galsworthy*

The great end of life is not knowledge, but action.

—*T. H. Huxley*

The Mechanism of Inflammation as Applied in Urology

Practical Aspects

WILLIAM P. HERBST, M.D., F.A.C.S.

WASHINGTON, D. C.

THE problems of acute, overwhelming, rapidly progressive, exhausting, fatal, infectious inflammatory processes following surgical procedures and the frequently recurring pyuria of the genitourinary tract incident to low resistance have been relatively frustrating problems over the years.

Contributions[1] in the field of the general adaptation syndrome and of shock, and, more recently, contributions to *The Mechanism of Inflammation*[2] have provided the practical therapeutic weapons with which this paper is concerned. In the field of shock, contributions have been so numerous and metabolically so complicated that they will not be discussed further than to recall that shock represents damage resulting from anoxia, hemorrhage and basic cellular cytoplasmic changes of varying degrees of reversibility and irreversibility. The general adaptation syndrome as presented by Selye[3] has provided what seems to be one of the most rational and logical explanations for most of the clinical phenomena observed. The basic thesis of the syndrome is that the body itself adjusts, reacts and accommodates itself to various loads in such a way that, barring exhaustion, it adapts itself successfully and satisfactorily. Exhaustion means death. *The Mechanism of Inflammation* contains innumerable and brilliant contributions by authorities from all over the world. These are most interesting, informative and valuable.

Unger[4] presented a schematic mechanism involving the fibrinolytic system, which indicates that histamine elaborated in a stage of proteolysis produces (1) vasodilation, (2) stasis and (3) increased vascular permeability. Figure 1, taken from *The Mechanism of Inflammation,* indicates where antihistamines and antiphlogistic endocrines may be used theoretically to counteract inflammation.[5] This presentation,[2] plus the contributions of Carson and Campbell,[6] Duran-Reynals,[7] Judd and Henderson,[8] Kindall and Nichols,[9] Mayer and Kull,[10] Rich and Lewis[11] and myself,[12] provide the rationale of using antihistamines and antiphlogistics in the treatment of acute infectious inflammatory conditions.

Menkin[2] studied the effect of anti-inflammatory substances on isolated cellular systems. He used the sea urchins' ova. After they had been exposed in sea water with a small amount of cortisone for fifteen minutes and then fertilized, cell division was observed. Variations in the incidence of cleavage were used as an indication of variations in cell activity.

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Cortisone, hydrocortisone and ACTH produced a depressing effect. STH did not.

Taubenhaus[2] observed that somatotropic hormone, thyroxin and desoxycorticosterone stimulated granulation tissue and that cortisone, hydrocortisone, estrogen, testosterone and methylandrostinediol inhibited granulation tissue. He also observed that banthine and dibenamine have an inhibiting effect on granulation tissue similar to that of some of the corticosteroids.

The availability of levophed is in itself life-saving when the blood pressure drops. Levophed has been used continuously over a period of many days, with eventual success so far as survival of the patient is concerned.

Levophed, the antiphlogistic substances, antibiotics and antihistaminics are the valuable therapeutic tools that are utilized to reduce mortality.

So far as the problems of general resistance are concerned, the idea entertained by the general public is about as satisfactory as that of the profession. It is generally recognized that psychic shock and depression, chilling, wetting and physical exhaustion, in addition to a low hemoglobin level and red blood cell count with normal white cell patterns, are the factors considered important in breaking down general resistance. Inability to reduce the frequency of the recurrent pyuria incident to pyelonephritis and cystitis has been extremely frustrating over the years. Recently it has been observed that this frequency may be prevented or reduced by giving very small doses of the antiphlogistic endocrines and other corticoids. As examples in these two fields, 2 cases are here reported.

REPORT OF CASES

CASE 1.*—An 85-year-old man had had recurring pyuria with fever, frequency and urgency of urination and varying amounts of residual urine for more than a year and had refused any surgical intervention. On May 30, 1956, he presented himself with a history of recent hematuria, chills, pains in the penis and inability to void. He was hospitalized, and catheterization produced 160 cc. of bloody, infected urine. The temperature rose to 105 F. in less than one hour, and the systolic blood pressure dropped to 70 mm. of mercury. He

*This case is reported by courtesy of Dr W P Herbst III

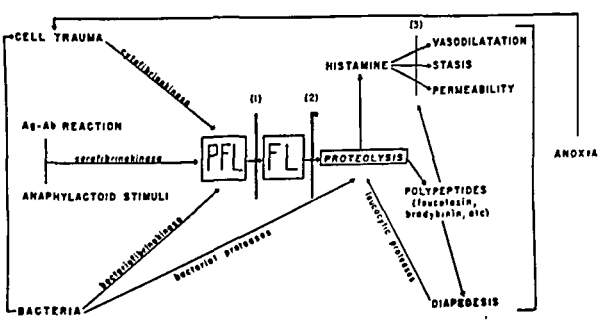

Fig. 1.—Role of the fibrinolytic system in the [illegible] profibrinolysin; *FL*, fibrinolysin [illegible] and [illegible] points at [illegible] 1952.)

PFL, be

was in profound shock. Levophed in distilled water was started at once, with 500 mg. of acromycin and 50 mg. of hydrocortisone given intravenously; the levophed was continued periodically for three days because the pressure would not stay up. Cortisone was given orally, 25 mg. twice daily, until June 8. On June 8 the patient was operated upon; suprapubic cystostomy was done without incident. On June 14 a second-stage prostatectomy was carried out, and the patient had no reaction to this procedure. He left the hospital on the tenth postoperative day. During his convalescence he was given 25 mg. of cortisone per day at first and then was maintained on 10 mg. per day. When he left the hospital he was given 5 mg. per day. In conjunction with this he was given antibiotics continuously, and they were continued after the cortisone was discontinued (this is very important).[13]

It seems reasonable to assume that, if levophed and the antiphlogistics had not been used,[12] the patient in this case would not have survived.

CASE 2.—This case is related to general resistance factors. A 50-year-old woman had been frequently hospitalized for prolonged, frequently recurring pyelonephritis. She was seen in consultation in the hospital during an acute pyelonephritic attack in September 1944. From 1944 until April 1953 she was hospitalized with recurrences of these acute febrile bilateral pyelonephritic and cystitic problems because of inability to control the infection with the customary supportive chemotherapeutic vitamin and antibiotic therapy. Upon discharge (April 28, 1953) cortisone, 2.5 mg. daily by mouth, was started. On May 15 the patient reported that she was "feeling fine" and gaining weight. By June 15 she had gained 5 pounds (2.3 Kg.). From this date until February 1956, at which time she moved to California, she took cortisone, 2.5 mg. per day, whenever she "felt herself slipping" and would take it for periods ranging from one to six weeks at a time.

Fig. 2 (*opposite*).—*A*, section of prostate of a patient who died after chills and fever immediately following urethral instrumentation prior to the current chemotherapeutic, antibiotic and antiphlogistic era. *B*, section of kidney of same patient. *C*, section from liver of same patient. Note innumerable embolic infectious foci.

COMMENT

It is noteworthy that no antihistamines were used in either of the 2 cases reported The reason is that they were not considered necessary My former publications[1-] contain information as to antihistamine therapy

Certain aspects of the method of utilization of the antiphlogistic endocrines and steroids are highly important The dose employed should not be more than is necessary to produce a favorable response, and this dose is frequently not over 10 mg of the steroid or 10 units of ACTH Chemotherapeutic agents and antibiotics should be continued after administration of the antiphlogistic substances has been discontinued This is because of the interference with antibody formation incident to antihistaminic therapy

There is no justification for concern over healing, electrolyte imbalance or other untoward reactions associated with the administration of small doses of these antiphlogistic substances It is only when the corticoids are administered in doses of over 75 mg or over a period of time that one need be concerned about the administration of these substances There are times when the control of fever calls for the administration of as large a dose as 600 mg of the corticoids, according to Doctor Mark Lepper This, of course, is rare and extremely frightening Nevertheless, one should not omit from one's experience the spectacularly effective results obtainable by using these substances, merely because unintelligent and inappropriate dosages have been used in the past

CONCLUSIONS

Relatively new therapeutic agents are available which make it possible to save lives that would otherwise be lost as a result of acute catastrophic, postoperative and other acute infectious inflammatory and shock syndromes

In the field of general resistance, in which recurrent attacks of acute pyuria occur frequently, there is available what seems to promise considerable improvement in control, i e, antiphlogistic endocrines

As further contributions to the study of the mechanism of inflammation are made, the present armamentarium will be increased

When the antiphlogistic endocrines are administered in large doses in conjunction with chemotherapeutic and antibiotic agents, administration of the chemotherapeutic and antibiotic agents should be continued after the antiphlogistics have been gradually discontinued

The innumerable reports of untoward reactions to large doses of antiphlogistic corticoids and other endocrine substances should not discourage the use of these substances in appropriate small doses, which are spectacularly effective

SCHLUSSFOLGERUNGEN

Es steht uns heute eine Reihe von Heilmitteln zur Verfugung, mit deren Hilfe ein Leben gerettet werden kann, das sonst den Folgen akuter katastrophaler postoperativer oder anderer infektioser Entzundungs- und Schockzustande zum Opfer gefallen ware

In Krankheitsfallen mit herabgesetzter allgemeiner Widerstandsfahigkeit, wo es haufig zu wiederholten Anfallen von akuter Harnvereiterung kommt, scheint ein beachtliches Mittel zur Kontrollierung dieser Zustande in den antiphlogistischen endokrinen Drusenpraparaten gegeben zu sein

Zukunftige Beitrage zur Kenntnis des Entzundungs verden terem Anwac tig neischatzes fuh

Wenn grosse Dosen antiphlogistischer endokriner Drüsenpräparate in Verbindung mit chemotherapeutischen und antibiotischen Mitteln verabreicht werden, soll die Behandlung mit chemotherapeutischen und antibiotischen Medikamenten nach allmählichem Absetzen der antiphlogistischen Mittel fortgesetzt werden.

Die zahllosen Berichte über unerwünschte Nebenerscheinungen grosser Dosen der antiphlogistischen Kortikoide und anderer endokriner Stoffe sollten uns nicht von der Verabreichung dieser Mittel in kleinen Dosen, die von eindrucksvoller Wirkung sind, abhalten.

CONCLUSAO

Agentes terapeuticos relativamente novos são agora viáveis, o que torna possível salvar vidas, que de outra forma estariam perdidas como resultado de catástrofe aguda, infecções inflamatórias pós-operatórias ou de outros tipos agudos e síndromes de choque.

No campo da resistência geral, no qual ataques recorrentes de piuria aguda ocorrem frequentemente, são viáveis oque parece prometer considerável melhora para o controle, isto é, os endócrinos antiflogísticos.

Conforme forem feitas contribuições posteriores para o estudo do mecanismo da inflamação, o arsenal presente será aumentado.

Quando os endócrinos antiflogísticos forem administrados em grandes doses em conjunto com os agentes quimoterapêuticos e antibióticos, a administração dêsses agentes deve ser continuada depois que os antiflogísticos forem gradualmente suprimidos.

Os inúmeros relatórios de reações desfavoraveis às grandes doses de corticoides antiflogísticos e outras substâncias endócrinas não devem desencorajar o uso dessas substâncias em pequenas doses apropriadas, que são espetacularmente eficazes.

CONCLUSIONI

Abbiamo a disposizione dei mezzi terapeutici relativamente moderni che consentono di salvare delle vite che un tempo si sarebbero certamente perdute in conseguenza di sindromi acute dovute a traumi, interventi chirurgici, processi infiammatori e shock.

Nel campo della resistenza generale, ad esempio, abbiamo a disposizione sostanze che sembrano promettere grandi effetti e cioè gli ormoni antiflogistici.

Man mano che si compiranno nuovi studi sul meccanismo dell'infiammazione aumenterà anche l'armamentario attuale.

Quando si somministrano le sostanze antiflogistiche in grandi dosi in associazione ai chemioterapici e agli antibiotici, questi ultimi devono essere continuati ancora per qualche tempo, dopo che i primi siano stati gradualmente sospesi.

Le numerosissime comunicazioni sugli effetti nocivi delle forti dosi di corticoidi antiflogistici e di altre sostanze endocrine non deve distogliere dall'impiego di tali sostanze che, in dosi opportune, hanno effetti spettacolosi.

CONCLUSIONS

Des agents thérapeutiques relativement nouveaux sont à notre disposition nous permettant de sauver des vies qui autrement seraient perdues. Lors de crises récidivantes de pyurée par exemple, nous disposons des antiphlogistiques dont l'emploi semble plein de promesses. Notre arsenal sera encore augmenté par les recherches en cours sur l'étude du mécanisme de l'inflammation.

Lorsque les antiphlogistiques sont administrés à hautes doses, associés aux agents chimiothérapiques et antibiotiques, ces derniers devraient continuer à être donnés après la diminution progressive des antiphlogistiques. Les innombrables rapports de cas rebelles à de fortes doses de corticoides antiphlogistiques et d'autres

substances endocrines ne devraient pas decourager l'usage de ces substances à petites doses appropriees, qui donnent des résultats positifs spectaculaires

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Aristotle, so far as I know, was the first man to proclaim explicitly that man is a rational animal His reason for this view was one which does not now seem very impressive, it was that some people can do sums He thought that there are three kinds of soul the vegetable soul, possessed by all living things, both plants and animals, and concerned only with nourishment and growth, the animal soul, concerned with locomotion, and shared by man with the lower animals, and finally the rational soul, or intellect, which is the Divine mind, but in which men participate to a greater or less degree in proportion to their wisdom It is in virtue of the intellect that man is a rational animal The intellect is shown in various ways, but most emphatically by mastery of arithmetic The Greek system of numerals was very bad, so that the multiplication table was quite difficult, and complicated calculations could only be made by very clever people Nowadays, however, calculating machines do sums better than even the cleverest people, yet no one contends that these useful instruments are immortal, or work by divine inspiration As arithmetic has grown easier, it has come to be less respected The consequence is that, though many philosophers continue to tell us what fine fellows we are, it is no longer on account of our arithmetical skill that they praise us

—*Russell*

Spontaneous Pyeloduodenal Fistula

Report of a Case

E. W. BAROOTES, M.D., F.R.C.S. (Can.)

REGINA, SASKATCHEWAN, CANADA

SPONTANEOUS pyeloduodenal fistula is a rather rare surgical entity. The purpose of this paper, with a report of 1 case and a review of the literature, is to stimulate discussion from more experienced urologists, and to obtain some expression of their past experience which may help in establishing some facts about the relative frequency, the causation and the pathogenesis of this surgical disease.

My interest in reporting this case was stimulated by an article that appeared in the June 1953 issue of the *Journal of Urology*, by Jones, Melendy and Flynn, of Boston. In this paper they reported a similar isolated case of spontaneous pyeloduodenal fistula, which had occurred six months prior to my encountering the patient whose case is here reported. Review of the bibliographies on spontaneous pyeloduodenal and nephroduodenal fistula revealed but few reported cases, but some interesting observations and information were obtainable.

Etiologic Factors and Pathogenesis.—In the past the most prominent etiologic agent appears to have been tuberculosis. There may be some fallacy in this conclusion, however, for it is in the early reported cases that one notes the diagnosis of tuberculosis most commonly. Pathologists and surgeons in those days were highly suspicious of any chronic granulomatous fistulous disease as being related to tuberculosis. It may be that in some of the early reported cases in which the condition was attributed to tuberculosis the theory was a mistaken one.

In general, one could state that any disease process involving the perirenal fascia and the peripelvic fascia, can conceivably rupture into the intestinal tract at the site of the duodenum and present a fistulous opening between the pelvis of the kidney and the lumen of the duodenum. The interesting feature is the rarity with which this occurs, rather than its frequency. The other interesting fact is anatomic; the duodenal area in its second part lies in direct and intimate relation to the medial portion of the right kidney and its pelvis. In this region the duodenum lies bare on its posterior surface, without the protective covering of a peritoneum, which, as is well known, offers a fairly resistant barrier to invasion by any inflammatory process. These anatomic facts show why an inflammatory reaction in the renal pelvis or in the perirenal fascia could conceivably open into the posterior surface of the duodenum and result in a fistula.

In this group of inflammatory causes may be included the presence of calculi in the renal pelvis. Whether the calculus precedes the fistula or is a result of the disease process is fairly hard to establish. It may be that inflammation within the renal pelvis itself can result in a peripelvic inflammation, with a peripelvic abscess that ruptures into the second part of the duodenum and the secondary formation of an infected stone in the renal pelvis. The reverse phenomenon is also possible. Inflammation in the renal pelvis may be second-

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ary to a renal calculus, resulting in a perinephric inflammatory reaction, abscess and subsequent fistula into the duodenum In this case the stone has preceded the formation of the fistulous tract

A second group of causes, of which the condition of Jones' patient was an excellent example, consists of neoplastic diseases of the renal pelvis, with or without calculus formation, invading the adjacent second part of the duodenum and resulting in a pyeloduodenal fistula

A third group of causes that comes to mind, and of which at first I considered my case an example, includes the possibility of a chronic duodenal peptic ulcer on the posterior surface of the duodenum, resulting in localized perforation with walling off of the inflammatory reaction, causing a local abscess posterior to the duodenum Further extension of this inflammatory process, through its pyogenic membrane, would rupture into the pelvis of the right kidney In order to establish a diagnosis of this variety with preceding duodenal ulcer, one must have a primary history of gastrointestinal disturbance, followed by an acute episode and the onset of symptoms referable to the urinary tract This is difficult to establish unless the patient has been undergoing continuous observance over a long period No proved cases of this have yet appeared in the literature It should be pointed out, however, that this form of causation is not as far-fetched as it first sounds, for similar circumstances exist in cases of rectovesical fistula resulting from diverticulosis and diverticulitis of the colon and going on to local abscess formation and subsequent rupture into the bladder This brings to mind the possibility that the cause is a diverticulum of the second part of the duodenum Diverticula of this portion of the duodenum are not uncommon, but most frequently they occur along its medial border

Symptoms —The presenting symptoms of pyeloduodenal fistula may be divided into three groups the gastrointestinal symptoms, the urinary symptoms, and finally the generalized symptoms of nutrition and cachexia

The gastrointestinal symptoms tend to predominate Most patients have had either bouts or continuous periods of nausea, often accompanied by vomiting, epigastric fullness, belching, diarrhea and flatulence Almost invariably they have a distate for food of any kind If the origin of the disease is gastrointestinal prior to the formation of the fistula, these symptoms should precede the urinary symptoms In any case, by the time the fistula has formed, the gastrointestinal symptoms tend to predominate In the odd case, the passage of gas and intestinal material through the bladder *per urethra* has been noted

The urinary symptoms are those of a generalized infection of the urinary tract or pyelonephritis of the right kidney, consisting of burning, frequency, dysuria and fever Frequently, there is steady and continuous pain in the right flank Often the urinary symptoms are preceded by an acute episode, during which one suspects that the fistulous tract has formed, the pyuria will persist through the entire course of the disease In 1 interesting case a large, tender mass presented frequently in the right flank, which, on being squeezed, caused the emesis of urine, with subsidence of the mass With the formation of calculi in the infected renal pelvis, small pieces of gravel may travel down the right ureter, resulting in ureteral colic The intensity of the vesical symptoms depends upon the amount of grossly pus-containing urine that descends to the bladder

The generalized symptoms, of course, are related to the marked inanition of the patient resulting from his poor nutritional

Data on Pyeloduodenal Fistula

Case and Author	*Year*	*Sex of Patient*	*Age of Patient*	*Cause*	*Treatment*	*Outcome*
1. Rayer	1839	F	45	?	Conservative	Death
2. Barlow	1843	F	26	Hydatid cysts	Conservative	Death
3. Bang	1874	F	22	Tuberculosis	Conservative	Death
4. Turner	1893	M	18	Tuberculosis	Conservative	Death
5. Pulvertaft	1935	F	28	Tuberculosis with calculi	Conservative	Death
6. Biondi	1935	F	28	Tuberculosis (?); perforated ulcer	Operative	Satisfactory
7. King	1950	M	62	Pyelonephritis and perinephritis	Operative	Satisfactory
8. Jones	1951	F	65	Epidermoid carcinoma and calculus	Operative	Death
9. Barootes* Present Case	1951	F	48	Renal calculus and pyelonephritis	Operative	Satisfactory

*Case reported in this paper.
After (1) King and (2) Jones and others.

state. As the disease progresses and the appetite wanes, the gastrointestinal symptoms worsen and the patient's general nutrition suffers badly. Most such patients present themselves in a cachectic state, with great loss of weight and profound anemia.

Physical Examination.—The results of physical examination are constant but few. Usually a hard palpable mass is present in the right upper abdominal quadrant or the right flank, and this is nearly always tender. The patient's weight loss, cachexia and anemia are obvious. Frequently, there is a septic type of fever.

Diagnosis.—The diagnosis is most frequently made on the basis of urologic and roentgen examinations, in which the fistulous tract connecting the pelvis of the right kidney with the duodenum may be demonstrated. Seldom is the urologist certain of his diagnosis prior to this examination, nor does he even suspect it. The roentgen demonstration of this fistulous tract may be accomplished by an intravenous pyelogram if the right kidney is continuing to function. If not, it is most commonly demonstrated by a retrograde pyelogram taken at cystoscopic examination, in which the dye is injected into the pelvis and passes into the duodenum. Diligent roentgenographic study may occasionally demonstrate thin barium passing through the duodenum and being milked gradually by the roentgenologist into the pelvis of the right kidney, a phenomenon which I have been able to demonstrate.

COMMENT

It can be seen from the accompanying table, which was taken from King and from Jones, that not only are reports of the disease uncommon but the results are less than happy. The predominance of tuberculosis as a causative agent in the early cases, has been discussed and may be a matter of seeing and recognizing most

often what one knows best It is noteworthy that in the cases managed surgically in more recent years the results have improved It is also worth pointing out that in 1 case calculus accompanied the formation of the fistula, as it did in the case here presented In 1 other case, perforated peptic ulcer of the type described in my comments on causation was suspected as an underlying etiologic agent Perhaps sufficient stimulation will arise from further publication of such cases to produce more information about the frequency of the condition and the underlying etiologic factors

REPORT OF CASE

A 48-year old woman was admitted to the hospital in September 1951, with a complaint of intermittent bouts of pain in the right lumbar region, of more than three years' duration The pain began in the right costovertebral angle, radiating forward into the groin and the loin, and was accompanied by bouts of burning, frequency and dysuria, with nocturia (twice) The symptoms had not been severe or disabling except in periods of acute exacerbation, when hyperpyrexia and chills occurred

For many years the patient had noticed gastrointestinal symptoms of various kinds—gradual loss of appetite, epigastric discomfort, particularly after the intake of food and frequently accompanied by postprandial belching, nausea and vomiting, which gave her some relief of symptoms She had been aware of these gastrointestinal symptoms for six years, and from previous investigation it was known that she had cholelithiasis with chronic cholecystitis

During the three years in which the urologic symptoms had been present, the loss of weight was profound (35 pounds, or 15 9 Kg), from an average weight of 145 pounds (65 8 Kg) to a weight of 110 pounds (49 9 Kg) on admission to the hospital

Six months prior to this admission she had been hospitalized elsewhere for urinary symptoms and severe pain in the right upper abdominal quadrant Acute pyelonephritis with a right staghorn calculus was observed, and an intravenous pyelogram showed no function of the right kidney She was intensely ill at this time, and one could reconstruct the story in tracing back the history to establish the fact that this was the period when the fistula between the kidney and duodenum had probably formed She recovered from this illness, but a second acute bout of gastrointestinal and urinary symptoms occurred two months later, and she was hospitalized elsewhere, at which time cholecystectomy and appendectomy were performed through a right upper quadrant incision The surgeon who did this operation reported that no acute intraperitoneal process was present, and the pathologist's diagnosis was "chronic cholecystitis with cholelithiasis" The patient made a slow convalescence from this operation and continued to show gross pyuria, loss of weight and increasing anemia Investigation for tuberculosis of the urinary tract was carried out, with negative results

Because of the continuation of weight loss and the urinary pathologic condition, the patient was referred to me in Regina and admitted to the hospital At this time she exhibited marked cachexia a poor appetite and obvious anemia, as well as inability to assimilate anything but fluids She was running about 2 degrees of fever through the day The urine showed 200 to 300 pus cells and a large mass was present in the right upper abdominal quadrant By this time the urine cultures done elsewhere for tuberculosis had been reported as "negative"

The large mass in the abdomen extended into the right upper quadrant The lateral border was discrete and tender, but the medial border was confluent with the rectus muscles and with the previous surgical incision for cholecystectomy A midline infraumbilical scar was present, which bore evidence of a previous cesarean section twelve years earlier

The essentials of the investigation were minimal The value for blood urea was 35 mg per hundred cubic centimeters Hematologic tests revealed secondary anemia with 52 per cent hemoglobin The leukocyte count was elevated to 17,600 per cubic millimeter, with a predominance of polymorphonuclear leukocytes Repeated cultures of the urine showed a heavy growth of colon bacillus

At cystoscopic examination an edematous swollen right ureteral orifice was noted with two large areas of ulceration in this region of the bladder Indigo carmine dye given intravenously appeared from the left kidney in good concentration in four minutes, but not at all from the right kidney in fifteen minutes A catheter pass [illegible] enal level of the left side produc [illegible] rm e,

but a catheter inserted on the right side would pass only 22 cm., at which level washouts revealed brownish dirty pus containing Bacillus coli. The most striking signs were in the retrograde pyelogram. A large staghorn calculus was noted in the region of the right kidney. When dye was injected via the ureteral catheter it passed readily into the duodenum, outlining the first, second and third parts of the duodenum and the jejunal duodenal flexure.

On seeing these films I hastened to the ward to reexamine the patient, worried lest the trauma of catheterization had caused this fistula. It was a relief to find the patient sitting up comfortably in bed and having a drink of clear soup. There had been no change in her condition from the previous hour.

Subsequently, with the help of the roentgenologist, I was able to demonstrate a niche and a crater connecting the duodenum to the renal pelvis. The material gathered in washing out the right renal pelvis showed contamination with duodenal contents.

In retracing the history, I was unable to establish any clearcut history of peptic ulcer prior to the onset of urinary symptoms. The gastrointestinal history at this time was most suggestive of cholecystic disease, although not even too strongly indicative of this. Certainly, at the previous laparotomy, no connection between the gallbladder condition and the stones could be made with a posterior peritoneal covering. The large renal staghorn calculus had been seen some three months prior to the gallbladder operation.

The preparation of the patient, because of her poor general condition, required several transfusions and the routine used for a gastrectomy.

At operation, through a generous right lumbar incision, a fairly marked inflammatory reaction of the perirenal area was observed. The entire perirenal fascia was adherent to all the surrounding tissues, and the right adrenal gland was well cemented to the upper pole of the kidney. The specimen was dissected *en bloc* down to the renal pedicle, which was fibrosed by inflammatory periarteritis and almost obliterated. The soft pultaceous stone could be palpated in the renal pelvis, and, as one approached the thick, hard fistulous tract entering the posterolateral surface of the duodenum, no distinction could be made between pelvis and duodenal wall. The ureter and the renal pedicle were clamped and ligated. I then cut across the tract, at the site in which the duodenum seemed to be located. It was most interesting to look into the duodenum from this surface opposite the common bile duct. There was no evidence at operation to support the theory that a duodenal ulcer crater might have been present in this area, for there was no fibrosis of the duodenum itself. There was no evidence of a duodenal diverticulum. The edges of the fistulous opening were resected down to normal duodenal tissue, and this opening was closed as one would close a duodenal stump in a gastrectomy. I considered leaving a thick catheter down to the site of perforation in case of any dire postoperative complications, but finally decided to leave a Penrose wick drain and closed the wound in the usual manner.

The patient did quite well postoperatively. When the renal pelvis was cut across some soft pultaceous stone escaped into the wound, and this was discharged subsequently in the course of the next few weeks.

COMMENT

Unfortunately, I did not see this patient for about one year, at which time she dropped into the office to pay her respects to one of the nurses who was a personal friend of hers. Her friend did not recognize her; she had gained some 45 or 50 pounds (20.4 to 22.7 Kg.). Postoperatively her weight had dropped to 90 pounds (40.8 Kg.), and at this time, one year after the operation, her weight was 147 pounds (66.7 Kg.). I have seen her on a few occasions subsequently, when she has come to Regina, and have taken some follow-up films. The first, an intravenous pyelogram, showed normal function of the remaining kidney, with no evidence of a right kidney. Additionally, I took a gastrointestinal series some few months ago, which showed no evidence of an ulcer crater or of any duodenal deformity.

At the time of writing the patient is in excellent health and is working to support a rather large family. Laboratory values, including hemoglobin, leukocyte count, etc., are within normal limits, and the level of blood urea remain at 25 mg. per hundred cubic centimeters. Urinalysis

shows no evidence of albumin, sugar, pus or blood

A few points of interest are as follows

1 The underlying cause of this spontaneous pyeloduodenal fistula has not been definitely established I could not prove duodenal ulcer with a local perforation as the cause of the fistula, with later calculus formation It is attributed to calculous disease of the renal pelvis resulting in peripelvic inflammation and an abscess that subsequently ruptured into the second portion of the duodenum

2 I have been able to rule out tuberculosis as an etiologic agent

3 The pathologist reported the kidney as showing chronic pyonephrosis with calculus Special examinations and staining for tuberculosis have failed to reveal any evidence of this

4 Sections of the renal pelvis taken from various areas have failed to reveal any evidence of carcinoma of the renal pelvis, and subsequent follow-up has disproved this

CONCLUSIONS

An additional case (the ninth) of spontaneous pyeloduodenal fistula with calculus formation is presented, including the history and the success of management by surgical intervention

A short tabular review of the previous cases recorded in the literature is presented

A discussion of the underlying etiologic and pathogenetic factors, together with the symptoms and management is included

Obviously, successful treatment is achieved only with surgical repair of the fistulous tract

CONCLUSIONI

Viene presentato un nuovo caso (il nono) di fistola spontanea con formazione di un calcolo, operato con successo, vengono anche riportati in sintesi tutti i casi precedenti

Viene trattata l'etiologia e la patogenesi della affezione, i suoi sintomi e la cura Naturalmente la guarigione si puo ottenere soltanto con la terapia chirurgica

SCHLUSSFOLGERUNGEN

Es wird uber einen weiteren (den neunten) Fall einer pyeloduodenalen Spontanfistel mit Steinbildung einschliesslich der Krankheitsgeschichte und des Behandlungserfolges mit chirurgischem Eingriff berichtet

Die Arbeit enthalt eine kurze tabellarische Übersicht uber die fruher publizierten Falle

Die der Erkrankung zugrunde liegenden ursachlichen und pathogenetischen Umstande, die Krankheitserscheinungen und die Behandlung werden erortert

Offenbar fuhrt ausschliesslich die chirurgische Reparatur des Fistelganges zu therapeutischem Erfolg

CONCLUSOES

O autor apresenta um caso adicional (nôno) de fistula espontanea com formação calculosa, incluindo o historico e o sucesso do tratamento pela intervenção cirurgica

Apresenta uma pequena revisão em quadro dos casos anteriores registrados na literatura

Inclui uma discussão dos fatores patogeneticos e etiologicos fundamentais, juntamente com os sintomas e tratamento

Torna se obvio que o tratamento bem sucedido so e alcancado pelo reparo cirurgico do tracto fistuloso

CONCLUSIONS

L'anamnèse d'un cas supplémentaire (le neuvième) de fistule spontanée avec formations calculeuses est présenté. Guérison par intervention chirurgicale.

Un tableau rappelle brièvement les cas précédemment mentionnés dans la littérature.

L'auteur discute les facteurs étiologiques et pathogéniques qui sont à la base de cette affection, ainsi que sa symptomatologie et son traitement. A son avis seule une intervention chirurgicale peut amener la guérison dans ces cas.

The great century [the nineteenth] rolled on and the pioneers in the art of healing saw victories taking shape. Joseph Lister, the newest prophet, was subduing that great cause of pain, the burning inflammation of the human tissues caused by microbes. Surgeons had put away their Prince Albert frock coats in which needles and sutures for sewing up the human organs were threaded like hooks in a fly-fisher's jacket, and everywhere the old art of healing was being penetrated by science. Chemistry and bacteriology were to prove that human bodies are simply machines, and that to heal them means understanding their laws.

Today we take for granted that there is a pure science of healing which can be cultivated apart from actual sick people, in rooms where microbes are grown like vegetables, where new drugs are made out of old poisons, where viruses unseen by any eye are measured, where a drop of your blood or a tiny speck of your liver can be examined like the core of an apple, and the secret malady of an individual patient may be measured in milligrams. This is all commonplace today. But the beginnings of scientific medicine were very different.

—*Williams*

Management of Advanced Carcinoma of the Breast

S. C. KASDON, M.D.*

BOSTON, MASSACHUSETTS

THE incidence of carcinoma of the breast as a cause of death in women in the area I serve is 3.9 per cent. This is significant in its relation to the 25 per cent incidence of carcinoma of the breast in women among *all cancers* reported in Massachusetts. In general, approximately 40 per cent of patients with carcinoma of the breast are alive and free from evidence of the disease five years after radical mastectomy. Extending the scope of the radically removed breast to include the internal mammary chain, one-half of the sternum, the costal cartilages of the ribs, etc., as practiced by Urban, Wangensteen and others, has altered these survival figures but little. As a matter of fact, McWhirter has claimed that simple mastectomy plus adequate roentgen therapy (3750 r) offers as good a five-year survival rate as does radical therapy.

There remain, then, 6 out of each 10 patients who will require further management of their disease by additional technics. Recent studies, stemming from Beatson's report (1896) that castration *results in improvement in recurrent or* metastasizing cancer of the breast, have presented a series of approaches which offer much to the well-being of these women and an apparent increase in the duration of their survival. At the onset it must be noted that women with untreated carcinoma of the breast survive for an average period of thirty-nine months. Any improvement in survival time must be compared to this basic figure.

The problem to be discussed here concerns the patient with either inoperable disease—local cutaneous involvement (peau d'orange), large axillary metastases, contralateral disease or distant metastasis—or with recrudescence of the disease after therapy previously applied. I am purposely omitting mention of roentgen therapy in this article, since it has been widely covered in the literature.

There is a definite relation between the development of mammary carcinoma and the onset of the menopause: five times as many women with this disease have *a late menopause* as compared with normal women; 54 per cent still menstruate beyond the age of 50. Cortical stromal hyperplasia of the ovary is present in 86 to 90 per cent of elderly women with carcinoma of the breast, as opposed to 34 per cent of "senile" women without the disease.

The establishment of lactation for four to six months reduces the incidence of mammary carcinoma. The lesion is more common in unm in marr women and occ ently nulliparous marri ried multiparae. O

*Associate Clinical Professor, Department of Obstetrics and Gynecology, Tufts University School of Medicine.

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tracted nursing (one to two years) is also hazardous in this regard. The role of the obstetrician in the management of this disease has frequently been overlooked.

To understand the natural history of carcinoma of the breast, one must divide the lesions into several categories, which will assist in the choice of therapy.

Approximately 40 to 50 per cent of young patients (premenopausal and ten to twenty years postmenopausal) have "estrogen stimulated" tumors; that is to say, the tumors are to some degree responsive to hormonal factors. Therefore, after careful clinical and roentgen evaluation, the endocrine status of the patient should be considered. Recent laboratory studies help in this respect. Urinary estrogens, calcium excretion and follicle-stimulating hormone determinations are helpful also.

The approach of the clinician to the problem of management thus can be presented as follows:*

Where adequate laboratory facilities are available, estimation of the estrogen output and of calcium excretion in the urine, with the response of these to the administration of stilbestrol, may be helpful at times. Since all patients under observation and treatment for this disease have an identical fatal outcome, however, the clinical approach on an empiric basis may be useful where limited laboratory facilities are a factor.

1. *Castration,* preferably surgical, should be carried out for every patient in this group at the appearance of recrudescence of the disease. Roentgen castration is less effective and the results less predictable. The operation is generally innocuous, and a favorable response is to be expected in 40 per cent of the patients thus treated.

2. *Estrogens* should rarely be used for any patient in this category.

3. *Androgens* are available and are widely useful to many of these patients. Testosterone propionate (75 to 150 mg. given intramuscularly three times weekly) is most often used and offers evidence of objective improvement in 40 per cent of "estrogen stimulated" tumors. The medication must be continued for four weeks before its effectiveness can be evaluated. The regressions may be visible by roentgenogram (bone metastases) or clinically (skin and soft tissue tumor). Gain in weight is common. Euphoria is frequently a desirable side effect. Decrease in pain due to metastatic disease may occur quite dramatically, resulting in ambulation of the bedridden patient.

Side effects that are almost universally present at this level of testosterone propionate administration are hirsutism, acne vulgaris and hoarsening of the voice. Increase in libido and growth of the clitoris occur after several months of therapy and may become troublesome. More serious, however, are the toxic manifestations—hypercalcemia and fluid retention. Calcium tetany can be fatal and must be especially guarded against in the case of the bedridden patient with bony metastases. Excessive fluid retention, which occurs in some degree in all these patients, can result in congestive failure in the patient with cardiovascular or renal disease.

Oral medication in the form of methyl testosterone (40 mg. daily) may occasionally result in a similar regression of the disease. The same side effects and toxic manifestations can be expected with this route of administration as are observed with testosterone propionate given intramuscularly. In addition, methyl testosterone causes occasional jaundice to appear, but this generally subsides with cessation of the therapy.

I have used a weakly virilizing androgen, methylandrostenediol (M.A.D.) over the past five years, with salutary effects.

*Limitations of space will confine most of my comments to the young patient (premenopausal) and also the patient from ten to twenty years past the menopause.

The dose is 150 mg. in pellet form, implanted subcutaneously at two-week intervals. Although the incidence of regression under this therapy equals that obtained with testosterone propionate, the degree of virilism, hirsutism, hypercalcemia and water retention associated with M.A.D. is markedly lower. There have been no instances of severe side reaction in more than 75 patients now treated with M.A.D. by this method, and the response to therapy remains approximately what one would expect from testosterone derivatives.

The remissions, when obtained under androgen therapy, last for six to eighteen months, and 1 patient I have treated with M.A.D. has remained alive and quite well for *seven years* since therapy was undertaken.

4. When *exacerbation* occurs, one still has several strings in one's bow that may result in repeated remissions. Frequently the exacerbation has been related to increase in estrogen production by, presumably, the adrenal gland. Cortisone by mouth (150 mg. daily for three days and reduced by 25 mg. daily every third day until a maintenance dose of 50 mg. daily is reached) should next be offered. A dose of 300 to 400 mg. per day of cortisone in the terminal stages of the disease may establish temporary control again. Side effects are frequent—peptic ulcer with perforation, diabetes mellitus, water and salt retention with edema, cardiac failure and pulmonary edema. Exacerbation of inflammatory disease, such as quiescent tuberculosis, may also occur, and appropriate safeguards and countertherapy are offered as indicated.

Fluorohydrocortisone can be used in doses of 5 mg. daily. Prednisone is used in doses of 24 to 30 mg. per day.

With the administration of corticoids, remissions may last four to six months, although some patients have remai[illegible] quite well for eighteen months or longer. The osteoporosis that results from prolonged administration of cortisone is an indication for continuation of androgen therapy. Should these therapeutic means fail, one can turn to additional surgical procedures.

5. *Adrenalectomy* can be offered next in line, and good remissions may be expected in up to 45 per cent of cases. The duration of remission may be as much as two years.

6. *Hypophysectomy* remains as a therapeutic measure that may be offered to those in whom the beneficial effects of the previous steps are disappearing and those in whom the response has been less than satisfactory. Approximately 50 per cent of patients treated with hypophysectomy have shown good remission. This effect may be due to the elimination of pituitary mammotrophic hormone and its supportive effect on carcinoma of the breast.

SUMMARY

In summary, then, for the young patient (premenopausal and ten to twenty years postmenopausal), *management* of advanced carcinoma of the breast can be offered in the following steps: (a) castration; (b) androgen therapy; (c) administration of cortisone; (d) adrenalectomy, and (e) hypophysectomy.

It must be emphasized that the side effects of these approaches are serious but manageable. Hope for the prolonged survival in reasonably good health of these women is real today, and hope for the future is burning brightly.

SUMARIO

O autor discute o tratamento de carcinoma mamário adiantado, chamando a atenção para o fato de que carcinoma não tratado dá em méd[illegible]vida de 39 [illegible]le limita

volvimento local da pele (peau d'orange), extensa metástases nas axilas, moléstia contralateral ou metástases distantes—mulheres com doença recrudescente que já sofreram terapia anterior.

Para as mulheres antes da menopausa e aquelas que passaram a menopausa dé 10 a 20 anos, o tratamento do carcinoma mamário avançado é assim descrito: (1) castração, (2) terapia androgena, (3) administração de cortizona, (4) adrenalectomia e (5) hipofisectomia. O autor salienta o fato de que êsses passos têm sérios efeitos laterais, mas são geralmente controláveis, e há bastante esperança de um período substancialmente prolongado de sobrevida.

RIASSUNTO

L'Autore esamina il trattamento del carcinoma mammario avanzato, facendo presente che qualora esso non venga operato si ha una media di sopravvivenza di 39 mesi. Egli si limita, in questa discussione, a prendere in considerazione le donne con tumore inoperabile—interessamento della cute (buccia d'arancio), grandi metastasi alle ascelle, diffusione controlaterale o metastasi a distanza—e le donne che, già sottoposte a terapia, presentano una recrudescenza del male.

Per le donne in pre-menopausa e per quelle che l'hanno superata da 10 a 20 anni il trattamento del carcinoma mammario avanzato è il seguente: 1) castrazione, 2) terapia androgena, 3) somministrazione di cortisone, 4) adrenalectomia e 5) ipofisectomia. L'Autore fa presente che tutte queste operazioni hanno effetti collaterali gravi ma sono generalmente ben tollerate e danno speranza ad un periodo di sopravvivenza maggiore.

ZUSAMMENFASSUNG

Der Verfasser erörtert die Behandlung des vorgeschrittenen Brustdrüsenkrebses und weist darauf hin, dass das unbehandelte Karzinom der weiblichen Brust eine durchschnittliche Lebensdauer von 39 Monaten mit sich bringt. Die vorliegende Arbeit beschränkt sich auf Frauen mit inoperablen Geschwülsten (Beteiligung der Haut—peau d'orange—ausgedehnte Metastasen in den Achseldrüsen, Beteiligung der anderen Brustdrüse oder Fernmetastasen), die nach vorangegangener Behandlung rückfällig oder schlimmer geworden sind.

Für Frauen vor dem Klimakterium und für Frauen 10 bis 20 Jahre nach der Menopause werden die folgenden Schritte zur Behandlung des vorgerückten Brustdrüsenkrebses angegeben:

1. Kastrierung.
2. Behandlung mit männlichen Keimdrüsenhormonen.
3. Verabreichung von Kortison.
4. Resektion der Nebennieren.
5. Resektion der Hypophyse.

Der Verfasser hebt hervor, dass diese Behandlungsformen mit schweren Nebenerscheinungen einhergehen, die sich jedoch im allgemeinen kontrollieren lassen, und dass sie zur Hoffnung auf erhebliche Lebensverlängerung berechtigen.

RÉSUMÉ

L'auteur discute le traitement du carcinome avancé du sein, dont la survie moyenne dans les cas non traités est de 39 mois. Il limite la présente étude aux cas de néoplasmes inopérables—avec extension locale à la peau (peau d'orange), métastases étendues de la région axillaire, affections controlatérales ou métastases éloignées—et aux cas de récidive après traitement.

Il décrit les méthodes suivantes pour les carcinomes avancés avant la ménopause et entre dix et vingt ans après la ménopause: 1) castration; 2) administration d'androgènes; 3) cortisone; 4) adrénalec-

tomie, 5) hypophysectomie L'auteur souligne le fait que ces thérapeutiques, malgré leurs effets secondaires sérieux que l'on peut en general combattre, permettent d'espérer une prolongation substantielle de la vie des malades

If the pain is below the diaphragm and does not seem to extend towards the clavicles, the belly should be softened with either black hellebore or purple spurge, adding to the black hellebore, parsnip, seseli, cummin, anise or some other fragrant herb, and to the purple spurge the juice of silphium These are also similar in effect if mixed with each other But black hellebore gives a better evacuation and one more likely to produce a crisis, while purple spurge is better for breaking up wind Both stop pain as do many other purgatives, but they are the best of those I know Purgatives administered in the gruel are also helpful, so long as they are not too unpleasant owing to bitterness or any other unpleasant taste, or owing to the size of the dose or colour or anything else that may make them distasteful

When the patient takes the purge, he should immediately be given a quantity of gruel not noticeably less than that to which he is accustomed It is however customary to give no gruel during the purging When purging stops, the less gruel than usual should be given, the amount subsequently being increased so long as the pain remains alleviated and no other contrary indication appears

If it is proposed to give only barley water, my advice is the same I believe it to be better to start giving gruel right away than to empty the body and then start a diet of gruel on the third, fourth, fifth, sixth or seventh day, unless the disease has already reached a crisis within that period

—*Hippocrates*

Vulvitis

RICHARD M. H. POWER, M.D.C.M., M.Sc., D.Sc., F.A.C.S., F.I.C.S., D.A.B.*

MONTREAL, QUEBEC, CANADA

EMBRYOLOGICALLY speaking, the skin of the composite structure known as the vulva arises from the *urogenital* sinus. The fetal milk line, which extends into the vulva, leaves the anlagen of the apocrine glands. Phylogenetically these glands exist in the vulva of the dolphin and in that of the lemur. In the human being they are classified as merocrine—apocrine and holocrine.

During secretion the "epithelial gland cells" remain intact in the merocrine; then degenerate in the holocrine, while the cytoplasm is extruded in the apocrine (sweat gland). The latter are more apt to give origin to the rare sweat gland tumors (hydradenoma) that occur in the region of the vulva.

The presence of these vulvar glands may be governed by factors other than embryologic, as the organization of body tissues depends on function; i.e., function governs form.

Embryonic development reveals structural anatomic similarities between the mouth and the vulva. Both areas, situated at the cranial and the caudal end of the gastrointestinal tract, are selective sites for certain dermatologic entities, such as leukoplakia. Secretions from the salivary and the Bartholin glands are both alkaline, and both are subject to autonomic nervous control. Sebaceous glands on the vermilion border of the lips and on the labia minora open directly onto the surface, as both are devoid of hair follicles. Both areas are richly endowed with nerves and with lymph and blood vessels. Both respond tinctorially to cyclic menstrual changes and to systemic vascular changes associated with anoxia, anemia and jaundice. Secretion is increased at both sites during pregnancy.

Anatomic Background.—Topographically the skin of the vulva extends anteroposteriorly from the mons veneris to the second and third sacral vertebrae; laterally, to the cruroinguinal folds.

The vulva includes the mons veneris, with its female hirsute escutcheon; the clitoris; the labia, minora and majora; the Bartholin glands; Skene's and para-urethral ducts; the hymen, which separates the vestibule and the vagina, and the perineum.

Opening onto the vulva are the orifices of the meatus urinarius and the vagina. The subepithelial structures—the nerves, fat, connective tissues, smooth muscle fibers and arteriovenous tree—are subject to benign or malignant neoplasia as are other regions of the body. The lymphatic, arterial and venous supply are unique in their clinical importance.

Nerves.—The nerve supply is of special interest to the gynecologist and to the dermatologist.

The nerves consist of both sensory and motor fibers, and are partly sympathetic and parasympathetic, derived from the hypogastric plexus, and partly spinal, derived principally from the pudendal plexus.

The anterosuperior part of the vulva is supplied by cutaneous branches from the ilioinguinal nerve; the posteroinferior part, by pudendal branches from the poste-

*Senior Attending Gynecologist and Obstetrician, St. Mary's Hospital; Consultant Gynecologist, Hopital Notre-Dame de l'Esperance, Montreal.

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rior femoral cutaneous nerve Between these two groups of nerves the vulva is supplied by the posterior labial and the perineal branches of the pudendal nerve.

The *pudendal nerve* arises from the second, third and fourth sacral levels Leaving Alcock's canal, its branches spread out in a "Spanish fan" pattern, with motor and sensory fibers to supply the integument and the sphincteric musculature of the vulva These branches are (a) the inferior hemorrhoidal nerve, to the muscle of the external sphincter and to the integument around the anus, (b) the perineal nerve, to the skin of the labium, the anterior part of the perineum and the sphincteric muscular group, and (c) the dorsal nerve of the clitoris, to the glans clitoridis, with fibers to the sympathetic cavernous plexus, which supplies all of the erectile tissue

The *ilioinguinal nerve*, arising from the first lumbar level, courses via the inguinal ring to the mons veneris and the labia The *genitofemoral (genitocrural) nerve*, its external spermatic branch has the same origin and runs via the round ligament to the labia

The *posterior femoral cutaneous (small sciatic) nerve* arises from the first, second and third sacral levels and sends a branch to the skin of the perineum *Perforating branches* arising from the second and third sacral levels and a *perineal branch* from the first are also present Finally to be included are the sacrococcygeal nerves

Fascia —1 *Camper's fascia*, the more superficial of the two fasciae concerned, consists of a fatty layer, continuous with

TABLE 1 —*Histologic Appearance of the Tissue and of the Fungi in Cases of Fungous Disease (W F Lever)*

Disease	*Histologic Appearance of Tissue*	*Average Size of Fungus Microns*	*Appearance of Fungus in Tissue*
Moniliasis	When invasive nonspecific granulation tissue with abscess formation	4	Mycelial threads and budding as well as nonbudding yeast cells (spores), round, thick-walled cells in giant cells and tissue, budding forms
Blastomycosis	Epithelial hyperplasia, tuberculoid granulation tissue with formation of small abscesses	10	
Torulosis	Chronic inflammatory infiltrate with extensive caseation	7	Round cells with wide gelatinous capsule
Chromoblastomycosis	Like blastomycosis	10	Round thick-walled, dark-brown cells, often in clusters Some cells possess cross walls
Coccidioidomycosis	Primary lesions like blastomycosis Secondary lesions tuberculoid granulation tissue with central suppuration and ulceration	40	Round, thick walled cells with granular cytoplas Larger cells contain endospores
Actinomycosis	Nonspecific granulation tissue with abscess formation	150	Large, irregularly lobulated granules with branching filaments and club formation at the periphery, usually no fungi, occasionally asteroid forms of fungous cells are present
Sporothrichosis	Primary lesion, nonspecific granulation tissue Subcutaneous nodules three zones chronic suppurative, tuber culoid and syphiloid zone	5	
Histoplasmosis	Chronic granuloma with foci of necrosis	3	N cells a cytopl large

TABLE 2.—*Ulcerative Lesions of the Vulva (Faulkner and Douglas)*

Syphilis: chancre; condyloma latum; gumma (rare)	
Characteristics when typical:	(a) Indurated punched-out ulcer; (b) flat raised moist papules; (c) indurated indolent ulcer
Frequent associated lesions:	Other evidence of syphilis; nonsuppurative inguinal adenitis
Diagnosis by:	Dark field examination; serologic tests
Chancroids:	
Characteristics when typical:	Soft dirty ulcers, usually with undermined edges
Frequent associated lesions:	Suppurative inguinal adenitis (buboes)
Diagnosis by:	Smear for Ducrey bacillus; culture when special facilities available; intradermal bacillary antigen test
Granuloma Inguinale:	
Characteristics when typical:	Spreading ulcer with beefy red granulations
Frequent associated lesions:	Spreads by skin continuity to form "pseudo" bubo (subcutaneous granuloma)
Diagnosis by:	Smear of small granulations for bipolar gram-negative bacillus (Donovan bodies)
Lymphogranuloma Inguinale: lymphopathia venereum; subacute inguinal lymphogranulomatosis; climatic bubo	
Characteristics when typical:	Evanescent primary ulcer usually unobserved; later, extensive scarring and secondary ulceration due to lymphatic involvement
Frequent associated lesions:	Lymphatic spread to produce (a) suppurative inguinal adenitis with chronic sinuses, and (b) rectal stricture with chronic fistulas
Diagnosis by:	Intradermal Frei test; culture of virus when facilities available Biopsy: nonspecific granulomatous inflammation
Herpes Genitalis:	
Characteristics when typical:	Pruritic grouped vesicles to secondary ulcer; tendency to recur
Frequent associated lesions:	Slight inguinal adenitis
Diagnosis by:	Clinical characteristics; culture possible but seldom practical
Acute Ulcer, Lipschütz (usually herpes genitalis):	
Characteristics when typical:	Shallow dirty ulcer or ulcers
Frequent associated lesions:	Said to be occasional similar oral ulcer
Diagnosis by:	Smear of culture for B. crassu (no proof that this organism is the pathogen)
Tuberculosis (rare):	
Characteristics when typical:	Indolent ulcer, painful, punched out
Frequent associated lesions:	Other tuberculous signs
Diagnosis by:	Biopsy: tissue stain for signs of tubercle bacillus
Carcinoma, primary or secondary:	
Characteristics when typical:	Nodular ulcer
Frequent associated lesions:	Usually leukoplakia with primary carcinoma; carcinoma elsewhere when secondary
Diagnosis by:	Biopsy

that on the lower portion of the anterior abdominal wall and posteriorly with the fat in the ischiorectal fossa.

2. *Colles' fascia*, the strong, deep membranous layer, is continuous with Scarpa's fascia, i.e., the deep layer of the superficial abdominal fascia. It is limited to the anterior half of the perineum. The vulval fascia is a continuation of the endopelvic fascia.

Lymphatics.—These are of paramount importance because of their potentiality for disseminating malignant cells. The vulvar tissues are rich in lymphatics, which intercommunicate not only anteriorly and posteriorly but bilaterally. The regional lymph nodes through which these channels drain are the superficial and deep inguinal, the femoral, the saphenous, Cloquet's, the external and internal iliac (hypogastric), the obturator, the common iliac, and the aortic, as well as those of the inferior vena cava.

Cloquet's gland is considered by some the axis gland of vulvar lymphatic drainage. The clitoris drains into this gland, which rests in the femoral ring.

The arteriovenous tree consists mostly of pudendal and femoral branches. The nerves and vessels follow a similar pattern of distribution in their adjacent course.

Labia Majora.—The labia majora are covered with a true skin, containing hair follicles and sebaceous and sweat glands, while the labia minora, which form the capuchon or hood of the erectile clitoris, have a skin comparable to the lips of the face, i. e., something between the skin and mucosa. The labia minora contain sebaceous and sweat glands but are devoid of hair follicles.

Clitoris.—The integument of the clitoris is similar to that of the labia minora.

Bartholin Glands.—These glands, with ducts opening at 4 and 8 o'clock caudal to the hymen, consist of transitional epithelium, as does the caudal urethra.

Physiologic Background.—Owing to urination, defecation and coitus, the vulva is the most physiologically traumatized area of the human body.

This extramüllerian epithelial appendage has a special responsiveness to endocrine and metabolic dysfunctions. With the former, this is noted at the menopause and in the presence of such clinical entities as kraurosis, leukoplakia, hypothyroidism, hyperthyroidism, adiposis genitalis, adrenal cortical hyperplasia and Addison's disease. Estrogen here, as elsewhere, produces increased vascularity, mitoses, epithelial hyperplasia and overdilation of vessels. The latter is inhibited by the addition of progestin. The changes of metabolic disease are mirrored in the vulva, e. g., among other conditions, diabetes, gout, jaundice and anemia.

*Spectrophotometric Determinations.** — These tests reveal variations in the concentration of pigment; in metabolism, with changes in the menstrual cycle and at ovulation. Alterations in the levels of melanin and carotene are observed. The value for hemoglobin is reduced, and oxyhemoglobin is present.

The skin of the vulva may be the seat of any dermatologic condition occurring elsewhere in the body. Neoplasms, which are usually grouped as separate entities, nevertheless demand differential exclusion and are mentioned, since a nodular growth associated with an inflammatory or exudative reaction may produce exudation, weeping, pruritus and vulvitis.

The vulva may be the site of any neoplasm, benign or malignant, that arises from structures of connective tissue, smooth muscle, fat, nerve or of vascular origin or from the integument itself.

Primary or secondary growth may appear as a metastasis from chorioepithelioma, endometrial implant roma,

*This has been verified by the w
ley with the Hardy recording spec

TABLE 3.—*Therapy of Ulcerative Lesions of the Vulva (Parks and Fraser)*

	Classification	*Diagnostic Aids*	*Specific Therapy*
Venereal	Microscopic Anatomy		
	Infections:		
	Gonorrhea— Paraurethral abscess; Bartholin abscess	Culture and smear	Penicillin; sulfadiazine; surgical incision
	Chancroid	Odor; culture; Ducrey skin test	Sulfonamides; aspiration of buboes
	Syphilis— Chancre Mucous patches Condylomata lata Tertiary lesions	Serologic tests Dark field study	Penicillin Bismuth Arsenicals
	Lymphogranuloma venereum (lymphopathia venereum)	Frei skin test	Frei antigen; sulfadiazine; aspiration of buboes; partial vulvectomy
	Granuloma inguinale	Tissue smear; Donovan bodies	Tartar emetic; faudin; streptomycin
Non Venereal	Candida (Monilia)	Culture and smear	Proprionate jelly; sodium lauryl sulphate compound; gentian violet, 2% aqueous
	Tinea cruris	Wet smear with sodium hydroxide 10%	Chrysarobin, 2%, in chloroform; local
	Tuberculosis	Biopsy	Dihydrostreptomycin & promizole; partial vulvectomy
	Diphtheria	Culture (k - L)	Antitoxin; penicillin
	Herpes zoster	Peripheral lesions	Autoinoculation
	Traumatic	History	Local antiseptics
Systemic diseases			
	Toxemia of pregnancy	B. P., urinalysis	Drainage of fluid; delivery
	Uremia	Blood urea nitrogen level	Relieve obstruction; Vitamins B and C; sulfadiazine
	Diabetes	Urinalysis; blood sugar level	Insulin; diet
	Pernicious anemia	Blood cell count	Blood transfusion; liver extract; vitamins B and C
	Agranulocytosis		Blood transfusion; pentnucleotides; penicillin
	Psoriasis	Complete physical examination	
	Rayon sensitization	Contact test	Eliminate rayon
	Vitamin deficiency (Ariboflavinosis pellagra)	Inspect mouth	Vitamin B complex; riboflavin; nicotinic acid
	Chronic atrophic dermatitis (Kraurosis and leukoplakia)	Biopsy	Local hygiene; dilute HCL or glutamic acid; hydrochloride; vitamins A and B; vulvectomy

TABLE 3.—*Therapy of Ulcerative Lesions of the Vulva (Parks and Fraser)*

Classification	*Diagnostic Aids*	*Specific Therapy*
Ulcerative Neoplasms		
Condyloma acuminatum	Biopsy	Local podophyllin 20% in oil or in tincture of benzoin, electrofulguration, partial vulvectomy, roentgen rays or radium
Carcinoma	Biopsy	Complete vulvectomy and inguinal lymphadenectomy

teratoma or melanoma

The malignant neoplasms encountered are usually spindle or basal cell carcinoma, anaplastic carcinoma, adenoacanthoma, adenocarcinoma (Bartholin gland), "rodent ulcer" (rare), intraepithelial carcinoma, Bowen's disease or extramammary Paget's disease of the vulva, sarcoma and the relatively rare melanoma and teratoma

Diagnosis.—The vulvar integument (the field of the gynecologist and the dermatologist) may be the site of any dermatological diseases encountered elsewhere in the human body The provocative agent may be primary or secondary, it may have a neurotrophic, metabolic, protozoal, viral or lymphatic origin, it may be congenital, inflammatory, degenerative, traumatic or neoplastic Although it is sometimes evident, at other times it is an enigma If there is doubt, consultation with a dermatologist and a pathologist will improve the outlook for all concerned

In addition to the general history, physical and visual lens inspection, complete urinalysis, a check of the sugar and acetone levels and a complete diagnostic survey of all ulcerative lesions of the vulva are mandatory This survey should include, in all cases, a Frei test for lymphopathia venereum, smears for Donovan bodies to establish the presence or absence of granuloma inguinale, smears for the Ducrey bacillus, the causative agent of chancroidal disease, smears for Bacillus crassus in Lipschütz ulcer, and serologic and dark field studies for the presence of Treponema pallidum A Wassermann test is essential in all cases Finally, biopsy of all lesions, to exclude malignant change, tuberculosis or one of the many mycotic diseases, such as actinomycosis and blastomycosis, is imperative

Although the causes of *vulvitis* are myriad, only the more frequently encountered clinical conditions will be mentioned in this short resume (1) pruritus vulvae, (2) burning sensation of the vulva, (3) fissure of the vestibule and the vulva, (4) burning sensation on urination, (5) dyspareunia, (6) vaginal discharge, (7) vulvar cutaneous rash, and (8) small ulcers of the vulva

Pruritus Vulvae.—Pruritus, from the Latin *prurire* (to itch) is a symptom of many diseases—never a disease of itself, but the commonest symptom of cutaneous disease The following classification under five headings may be used as a working basis to distinguish the etiologic factor or factors in pruritus vulvae

1 Pruritus associated with a general disease
   (a) Metabolic disturbances, e g, diabetes, avitaminosis, gout, jaundice, chronic nephritis, anemia (microcytic)
   (b) Endocrine disorders, e g, hyperthyroidis (eating), hypothyroidis (in) hypopituita

adrenal cortical hyperplasia (virilism), or a male escutcheon of the mons veneris

(c) Toxic conditions, e.g., jaundice, drugs, the toxemia of pregnancy

(d) Allergic conditions, i.e., part of a generalized cutaneous outbreak

(e) Vascular diseases, e.g., leukemia, reticulosis, Hodgkin's disease, blood, dyscrasia

(f) Cutaneous diseases, e.g., lichen planus, psoriasis, seborrhea

(g) Psychic disorders, e.g., psychoneurosis, psychosomatic conditions, neurodermatitis, mental fatigue, psychic trauma, tension and anxiety, lower threshold for sensation of itching

2. Pruritus associated with a lesion of the anus or rectum (pin worms)
3. Pruritus associated with lesions of the genital tract

Vaginal infections:

1. Venereal: (a) gonorrhea (condyloma, bartholinitis, skeenitis); (b) chancroid; (c) syphilis (condylomata latum); (d) venereal lymphogranuloma; (e) granuloma inguinale.
2. Nonvenereal: (a) mycotic; (b) true fungous; (c) trichophytosis (ringworm, tinea crura, Dhobie itch); (d) pyogenic (staphylococcus; B. coli); (e) trichomoniasis; (f) monilia; (g) infections of the cervix and the upper part of the genital tract; (h) fistulas, urinary or fecal.
3. Pruritus due to a purely local condidition: (a) of chemical origin, due to soaps or medicaments; (b) due to parasites (pediculioxyuris, scabies); (c) due to infection: acute, e.g., sepsis; chronic, e.g., tuberculosis; (d) due to leukoplakia, kraurosis, eczema, intertrigo; (e) due to carcinoma (intraepithelial; Paget's or Bowen's disease), and (f) due to herpes.
4. Idiopathic conditions.

SUMMARY

The author discusses the embryonic, anatomic, physiologic and neural aspects of the vulva, its neural, fascial, lymphatic and organic environment and the diagnosis and treatment of the pathologic conditions to which it is liable. Extensive tabulations of the relevant data are included, as is a classification of pruritus vulvae under five headings, which the author presents as an aid in determining the causation of this disorder.

ZUSAMMENFASSUNG

Der Verfasser erörtert die Embryologie, Anatomie, Physiologie und Nervenversorgung der Vulva sowie die Faszien, Lymphwege und Organe in ihrer Umgebung und die Diagnose und Behandlung von Krankheitszuständen, die sich in der Vulva entwickeln können. Die Arbeit enthält umfangreiche tabellarische Darstellungen wichtiger Daten.

RIASSUNTO

L'autore descrive gli aspetti embrionali, anatomici, fisiologici e nervosi della vulva, le sue connessioni fasciali, linfatiche e organiche. Tratta, inoltre, delle affezioni più frequenti di essa. I dati più importanti sono riassunti in tavole.

RÉSUMÉ

L'auteur discute les aspects embryonnaire, anatomique, physiologique et neural de la vulve, de son revêtement par le fascia, et de ses connections lymphatiques et organiques, ainsi que le diagnostic et le traitement des états pathologiques auxquels elle est sujette.

Son étude est accompagnée d'une classification détaillée.

SUMARIO

O autor discute os aspectos embriônico, anatômico, fisiológico e neural da vulva, seu envólucro fascial, linfático e orgânico e o diagnóstico e tratamento das condições patológicas às quais é sujeita. Extensos quadros dos dados relevantes são incluidos.

It is important that we remember the changing status of a dying man. When a patient is nearing death, the dying process is physiologically a universal one. Brain, heart, kidney—all parts die a little at a time until all life ends. The patient's sensibilities wane but each step towards his end is short and remains unnoticed in the course of a gradually diminishing life activity. One sometimes feels that a patient is pretending that things are better than they are. He probably is not. He is living a life of his kind for that moment. This is seen plainly in a chronic disease associated with slowly progressive anemia. The patient when reaching a physician complains of tiredness, weakness, easy fatigue, breathlessness, loss of mental concentrating powers, apathy to former interests. If all of these ills had come upon the patient suddenly, he would have been overwhelmed by the impact. Yet each quantity of disability, added to a growing load, was barely perceived by the patient. Only when friends point out the dramatic transformation from the person they know does it dawn upon him that something dreadful has taken place without his being aware of it. This man is not pretending. His faculties for recognition of change have deteriorated from the same cause that produced the change itself. It is unlikely that the thought of his impending death obsesses the patient. He wants to be relieved of the difficulties imposed upon him by his disease. It does not enter his thinking that pain, cough, sleeplessness, or breathlessness may be the early harbingers of inevitable death.

—*Standard*

The Possible Importance of the Bladder in the Estral Cycle

JOSÉ MEDINA, M.D., F.A.C.S., F.I.C.S., AND
CARLOS ALBERTO SALVATORE, M.D., F.I.C.S.
SAO PAULO, BRAZIL

IN a recent work, Luisi[1] suggested that the permanence of urine in the bladder conditions the reabsorption of substances that would act to cause the onset of menstruation. In support of this hypothesis he pointed out the occurrence of amenorrhea in patients with vesicovaginal fistula, arguing on this basis that the bladder takes part in the mechanism regulating the menstrual cycle. The vesical epithelium would absorb estrogenic metabolites, giving rise to a "urinary menstrual factor" which would act to regulate the flow.

According to Antognetti and Ogorek (cited by Luisi[2]), the estrogens have an antidiuretic action in the premenstrual period, causing an insufficient concentration of estrogenic substances in the vesical urine, so that the "urinary menstrual factor" supposed to be capable of causing the onset of menstruation is not formed. According to Luisi,[2] this would explain the occurrence of amenorrhea in cases of vesicovaginal fistula and of menstrual irregularities in cases of polyuria.

We thought it interesting to study, as a working hypothesis, this theory of the possible intervention of the bladder in the menstrual cycle. We resolved, therefore, first to test it under experimental conditions and to control, by vaginal smear, the estral cycle, which reflects the fluctuation of estrogens circulating during the reproductive period of the organism. It is known that there is not always an exact parallelism between the estrogenic modifications of the endometrium and those of the vagina. In the female rat, however, such a relation exists, and various authors, including ourselves in later experiments,[3] have been able to demonstrate the perfect agreement between the phases of the estral cycle and those of the vaginal cycle.

The idea of studying cyclic variations in the vaginal smear of the female rat before and after cystectomy arose from the theory that, after removal of the bladder, i.e., the organ that collects the urine, estrus would not appear—because, according to Luisi's conception, absorption of the estrogenic metabolites necessary to the menstrual cycle takes place in the bladder.

Estrus in the rat repeats itself every four to six days, and the vaginal smear presents four clear and distinct phases: a diestral phase, or resting interval; a proestral phase, that of proliferation, an estral phase, which is the period of ovulation and during which estrogenic action is at its maximum, and a meta-estral phase, during which regression takes place. Amenorrhea in women is correlative in the rat with the nonoccurrence of the estral cycle, i.e., anestrus.

In this presentation we shall report the results of our studies of vaginal smears taken daily from female rats before and after partial cystectomy, with emphasis

From the Gynecological Department of the Medical School of the University of Sao Paulo.
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on the possible importance of vesical urinary stasis in the estral cycle

Material and Method.—On some of the rats we performed a preliminary experiment by creating a vesicovaginal fistula This was followed, in each instance, by infection and death of the animal We next attempted partial cystectomy with the intention of leaving only the vesical trigone as a conduit joining the ureters to the urethra We endeavored to make the ligature immediately above the urethra and ureters, leaving only the trigonal region (Fig 1).

In 30 adult rats the estral cycle was daily controlled by vaginal smear for one month, and it was noted that estrus appeared regularly every four to six days After this we operated on all the animals, using ether anesthesia An incision was made in the lower part of the abdomen and partial cystectomy was performed, only the vesical trigone, i e, that portion of the bladder at which the ureters disembogue, being left intact Immediately above the trigone a ligature with silk thread was performed, and the vesical sac was sectioned The abdominal cavity was closed with two continuous sutures, one in the peritoneum and muscles and the other in the skin The vaginal smear continued to be studied daily In the first four to six days after the operation 5 animals died The 25 survivors recovered after a few days, displaying good abdominal cicatrization, and all had a healthy appearance during another month and a half of control They were then killed with ether and subjected to autopsy

Results.—All the rats, from the beginning of the experiment to the date of operation, presented regular estral cycles Figure 2 shows the incidence of estrus only after the twenty-fifth day of the experiment, slightly before the operation Of the 25 rats studied, 5 (Nos 1, 9, 10, 16 and 20), from a point in time immediately after the operation, were anestral for eight to ten days, which is the equivalent in time to two estral cycles Immediately thereafter, however, the cycles became regular again and remained so to the end of the experiment, which lasted a month and a half In the remaining 20 rats partial cystectomy did not interrupt the sequence of regular estral cycles The duration of diestrus (the resting phase) in the 5 animals first mentioned seems to have been a consequence of the operation From this we conclude that, not only in these 5 but in the remaining 20, removal of the vesical sac failed to interfere with the regularity of estrus or the estral cycle

Autopsy, performed on the 25 rats a month and a half after the operation, revealed the following data In 18 rats the opening of the abdomen revealed only the vesical trigone, remaining in the form of a conduit between the ureters and the urethra There was no dilatation of either the trigone or the ureters The trigone, when opened, revealed normal disemboguement of the ureters and the urethra In the remaining 7 rats we observed partial dilatation of the vesical trigone, which had formed a small sac approximately one third the normal size of the bladder Opened, these trigones were seen to contain a small quantity of collected urine, similar to that present in normal rats In these 7 animals, therefore, there was partial compensatory reconstitution of the bladder, probably owing to the fact that the ligature had been placed a little higher than the point of insertion of the vesical walls into the

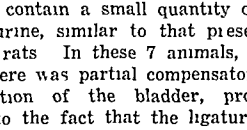

Fig 1.—Position of ligature in experiments on female rats

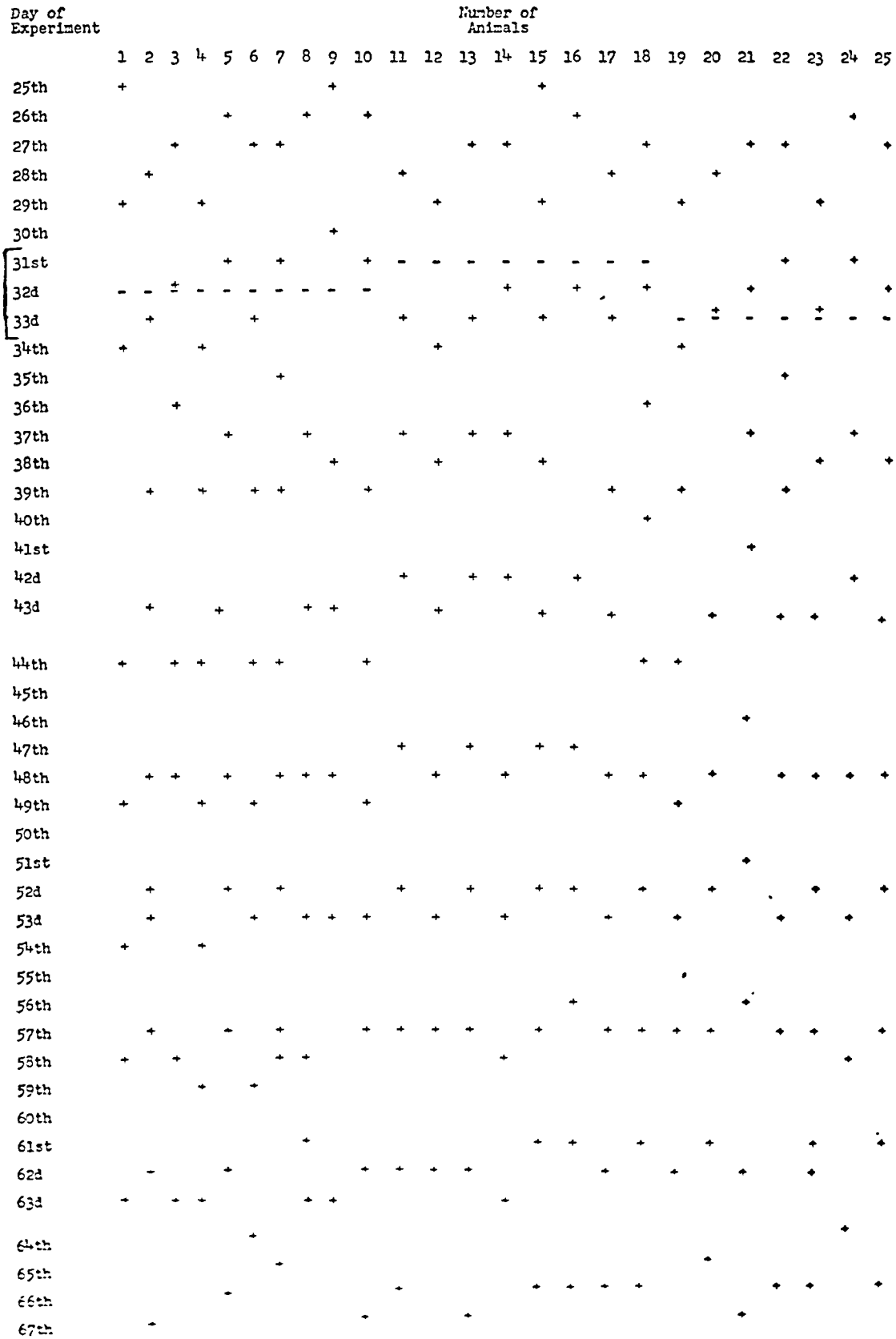

Fig. 2.—Incidence of estrus in partially cystectomized rats. *Minus sign* indicates date of operation (thirty-first to thirty-third day of experiment); *plus sign*, occurrence of estrus.

vesical trigone, above the ureters and the urethra. In none of the animals did we observe any macroscopic modifications of the ureters, the urethra or the kidneys.

COMMENT

It is known that amenorrhea is likely to occur in approximately 12 to 15 per cent of the cases of vesicovaginal fistula. In 70 per cent there are no alterations in the menstrual cycle. Luisi, however, attributed this to the absence of static urine in the bladder, from which would result substances of the histaminic or estrogenic type that would be reabsorbed to constitute the "menstrual factor."[1] He stated that menstrual irregularities and even amenorrhea may occur in a woman with a permanently catheterized bladder and that the "faulty cases" are due to poor vesical evacuation.

In none of the experiments we performed on the 25 rats, with drainage in the majority of cases to prevent vesical retention of urine and despite the fact that partial reconstitution of the bladder occurred in 7, did we observe the disappearance of estrus during the one and one-half months following the operation. The phases of the estral cycle as studied by vaginal smear were highly characteristic: (1) diestrus, with leukocytes and mucus present but with few epithelial cells and no keratinized cells; (2) proestrus, in which no leukocytes, mucus or keratinized cells were present but epithelial cells were abundant; (3) estrus, in which no leukocytes, mucus or epithelial cells appeared but keratinized cells were present, intensely acidophilic or eosinophilic, and (4) meta-estrus (regressive phase), which was characterized by a large invasion of leukocytes, with a few keratinized cells still present. Anestrus was marked by a prolonged interval, with a smear similar to that of diestrus. This phase corresponds to human amenorrhea.

In 25 partially cystectomized animals the estral cycle continued to occur regularly. In only 5 was there prolonged diestrus (anestrus), corresponding in time to two estral cycles, with subsequent return to regularity. Although autopsy revealed vesical neoformation in 7 rats, with retention of urine, the remaining 18 showed complete absence of trigonal dilatation, and as has been stated, the estral cycle continued to occur regularly in all 25. This permits the conclusion that, at least in the rat, removal of the bladder to prevent the normal retention of urine does not alter the estral cycle. The bladder, therefore, seems to play no role in this mechanism. Although further experiments are needed, our first results do not support the hypothesis that the organ is concerned in either the menstrual cycle or the onset of menstruation.

SUMMARY AND CONCLUSIONS

The authors have studied the estral cycle in rats partially cystectomized and controlled by vaginal smear, on the basis of the hypothesis that within the bladder there may be reabsorption of substances capable of influencing the onset of menstruation, which would explain the occurrence of amenorrhea in a patient with a vesicovaginal fistula. These studies revealed the following data:

1. The estral cycle after partial cystectomy continued to occur regularly in 100 per cent of the cases. In 72 per cent there was no dilatation of the trigone.

2. The bladder, with its physiologic retention of urine, appeared not to interfere with the estral cycle.

3. In 20 per cent of the animals anestrus was observed, with a duration equivalent to that of two estral cycles, immediately after the operation. This was followed, however, by normalization of the cycles, whic trolled by va-ginal smear, du nd a

4. Autopsies of the partially cystectomized rats revealed compensatory dilatation of the vesical trigone in 28 per cent of the cases.

In the light of these observations, the authors conclude that the bladder has no part in the mechanism of menstruation or the menstrual cycle. Further experiments will be needed to confirm this conclusion.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Die Verfasser haben mit Hilfe von Vaginalabstrichen den Brunstzyklus von Ratten studiert, an denen eine partielle Resektion der Harnblase vorgenommen war. Sie gingen von der Vorstellung aus, dass es vielleicht auf dem Wege über die Harnblase zu einer Rückabsorption von Stoffen kommt, die auf das Einsetzen der Brunst einen Einfluss haben können, und versuchen auf diese Weise die Amenorrhöe von Kranken mit Blasenscheidenfisteln zu erklären. Sie gelangen zu folgenden Schlussfolgerungen:

1. In hundert Prozent ihrer Fälle beobachteten sie nach partieller Blasenresektion eine regelmässige Fortsetzung des Brunsztzyklus. In 72% der Fälle bestand keine Erweiterung des Blasendreiecks.

2. Die Harnblase scheint mit ihrer physiologischen Verhaltung des Urins keine Störung des Brunsztzyklus hervorzurufen.

3. In 20% der Fälle wurde unmittelbar nach der Operation eine sich über zwei Zyklen ausdehnende Verlängerung der brunstfreien Periode beobachtet. Darauf erfolgte aber innerhalb von anderthalb Monaten eine Normalisierung der Zyklen, die durch Vaginalabstriche kontrolliert wurden.

4. Die Sektion der Ratten, an denen eine partielle Harnblasenresektion vorgenommen worden war, ergab eine kompensatorische Erweiterung des Blasendreiecks in 28% der Fälle.

RIASSUNTO E CONCLUSIONI

Gli Autori hanno studiato il ciclo estrogeno in ratti parzialmente cistectomizzati e tenuti sotto controllo con strisci di secreto vaginale, nella ipotesi che, tramite la vescica, vi possa essere un riassorbimento di sostanze capaci di influenzare la comparsa delle mestruazioni, il che spiegherebbe l'amenorrea in pazienti con fistole vescico-vaginale.

Le conclusioni sono le seguenti:

1. Nel 100% dei casi, anche dopo parziale cistectomia, il ciclo estrogeno continua regolarmente. Nel 72% dei casi non si ha dilatazione del trigono.

2. Non sembra che la vescica, con la sua fisiologica ritenzione di urina, interferisca col ciclo estrogeno.

3. Nel 20% degli animali si ebbe cessazione delle mestruazioni subito dopo l'intervento e per la durata di due cicle estrogeni. Esso, però, fu seguita da normalizzazione dei cicli che furono controllati per un mese e mezzo mediante strisci vaginali.

SUMARIO E CONCLUSOES

Os autores estudaram o ciclo estral em ratos parcialmente cistectomisados e controlados pela secreção vaginal, na base da hipótese de que por meio daibexiga pode haver reabsorção de substâncias capazes de influenciar o surto da menstrução, o que explicaria a amenorreia em pacientes com fístulas vesicovaginais. As conclusões foram as seguintes:

1. O ciclo estral depois da cistectomia parcial continuou a ocorrer regularmente em 100 por cento dos casos. Em 72 por cento não houve dilatação do trígono.

2. A bexiga, com sua retenção fisiológica da urina, não parece interferir com o ciclo estral.

3. Em 20 por cento dos animais anestro

foi observado, com uma duração de 2 ciclos estraes, imediatamente depois da operaçao Isso foi acompanhado, entretanto, pela normalizaçao dos ciclos, que foram controlados pela secreção vaginal, durante um mes e meio

4 As autópsias dos ratos parcialmente cistectomizados revelaram dilatação compensatoria do trigono vesical em 28 por cento dos casos

RÉSUMÉ

Les auteurs ont etudie le cycle oestral chez des rats partiellement cystectomises et contrôles par des frottis vaginaux Leurs recherches sont basees sur l'hypothese selon laquelle il se produirait par la vessie une reabsorption de substances capables d'influencer le point de depart des menstruations, ce qui expliquerait l'amenorrhee chez les malades atteintes de fistules vesicovaginales Les auteurs ont abouti aux conclusions suivantes

1 Apres cystectomie partielle le cycle oestral est reste normal dans 100% des cas 72% des cas n'ont pas montre de dilatation du trigone vaginal

2 La vessie, avec une retention urinaire physiologique, ne semble pas avoir d'influence sur le cycle oestral

3 Un anestrus d'une duree de deux cycles a ete observe dans 20% des animaux en experience immediatement apres l'operation Le cycle oestral a cependant repris son cours normal, controle par des frottis vaginaux durant un mois et demi

4 L'autopsie des rats partiellement cystectomises a montre une dilatation compensatrice du trigone vaginal dans 28% des cas

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Author s Correction In the article Uterine Bleeding in Early Pregnancy' by Dr Charles E Galloway F A C S F I C S D A B which appeared in the August 1950 issue of the Journal Dr Galloway requests us to say that Table 5 should not have been included This correction has been made in Dr Galloway s reprints We regret that it reached us too late to be made in the Journal

Spondylolisthesis

Surgical Fusion of Lumbosacral Portion of Spinal Column and Interarticular Facets; Use of Autogenous Bone Grafts for Relief of Disabling Backache

HENRY W. MEYERDING, M.D., F.A.C.S., F.I.C.S., D.A.B.*

ROCHESTER, MINNESOTA

WHEN disabling backache, relieved by rest but aggravated by occupational stress and strain, occurs in what appear to be normal and healthy men and women, it presents a problem in diagnosis and treatment. In the face of prolonged disability, workmen's compensation, factors of insurance and even litigation, questions as to the etiologic factors responsible for the complaint arise, and the duration of the condition is speculated upon.

Spondylolisthesis is a displacement, usually forward, of the fifth lumbar vertebra on the sacrum. It occurs in other areas of the spinal column and may exist for years without producing symptoms, but as a result of strain or trauma it may produce disabling backache.

Kilian, in 1853, gave the name "spondylolisthesis" to the condition, and for many years it was considered as occurring mostly in women as a complication of childbirth. With the discovery and more frequent use of the roentgenogram, congenital and acquired defects of the lumbosacral area of the spinal column became evident which could not be recognized by physical examination alone. Modern surgeons have learned that anteroposterior roentgenograms alone are not sufficient, and that for recognition of defects of the neural arch, absence of articular facets, spina bifida occulta and displacements of the vertebrae it is necessary to have lateral and oblique views (Fig. 1, *a*, *b* and *c*). Such defects in the lumbar part of the spinal column often exist without causing symptoms, but when they are subjected to repeated strain or trauma the lack of skeletal support allows the fifth vertebra to slip forward and to exert tension and cause stretching of the ligaments. Backache in the lumbosacral area results and is aggravated by occupational strain or any form of lifting. It is usually relieved by recumbency and rest. When defects of the skeletal system exist, there are also ligamentous weaknesses, and the downward and forward angle of the lumbosacral articulation fails to hold the superimposed weight; this is observed especially during pregnancy, in the presence of obesity and in any occupation that requires weight bearing and working in a stooped position. A single severe trauma may cause spondylolisthesis in an apparently normal person, as the case to be reported will show.

ILLUSTRATIVE CASE 1 *(twenty-year cure; end result, after spinal fusion, for patient with*

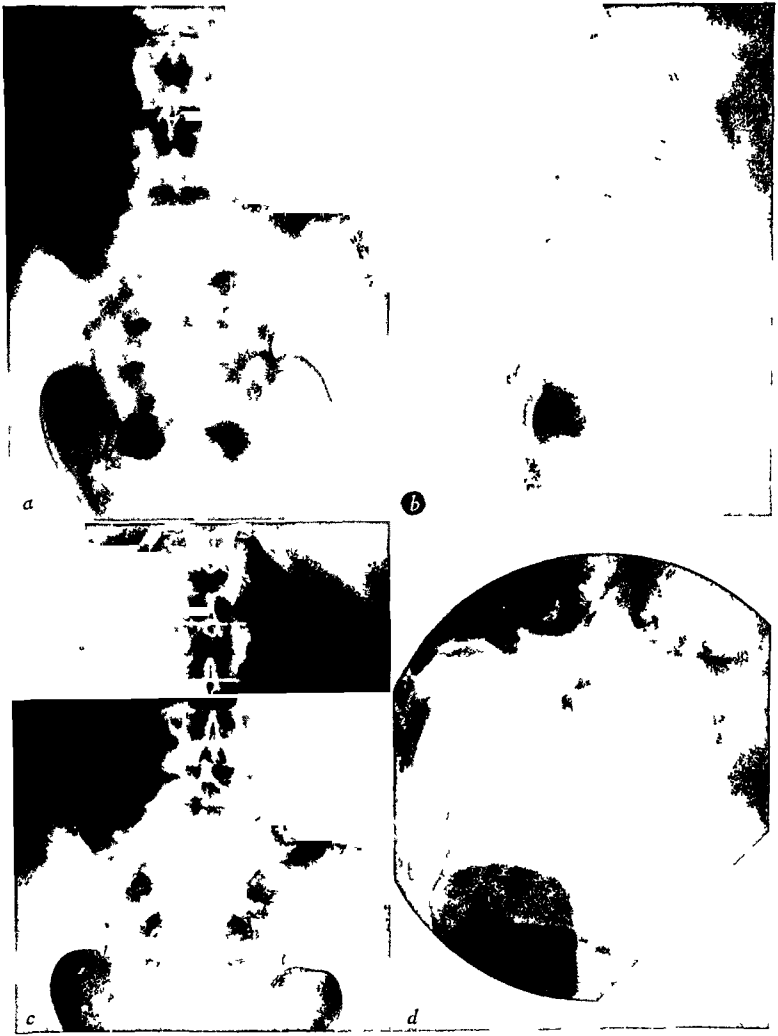
Fig. 1.—Anteroposterior (*a*), lateral (*b*), and oblique (*c*) roentgenograms in the first case. Lateral film shows Grade 1 spondylolisthesis of the fourth lumbar vertebra and separation of the lamina at the pars interarticularis. Oblique roentgenogram (*c*) shows clearly the separation of the pars interarticularis on the left side; the right side (not shown) contained a similar defect. Note: Comparison of the anteroposterior (*a*) and the oblique (*c*) view shows clearly the advantage of the latter in determining the presence of separation of the neural arch.

spondylolisthesis of the fourth lumbar vertebra and separation of the neural arch).—A rancher complained of backache that had been present for three years. He had ridden horses most of his life, and remembered that fifteen years earlier a horse had fallen on him. He had done hard work and had not been disabled, but his symptoms were aggravated by bending and lifting. Examination disclosed some degree of spinal stiffness. Roentgenograms showed Grade 1 spondylolisthesis of the fourth lumbar vertebra with separation of the fourth neural arches (pars interarticularis) and slight slipping of the vertebrae (Fig. 1). A fusion operation was performed, in which two massive grafts and bone chips from the tibia were used (Meyerding technic); the fourth spinous process and lamina were loose but were not excised. This patient has been seen numerous times since the operation; he has

Fig. 2.—*Left*, anteroposterior roentgenogram showing fracture of the pars interarticularis on both sides; spina bifida occulta of the sacrum. *Right*, lateral roentgenogram showing the fourth lumbar vertebra displaced forward (Grade 1) on the fifth lumbar vertebra, separation of the pars interarticularis and slight narrowing of the fourth interspace are shown. (*Reproduced, with permission of the publishers, from Meyerding, H. W.: Spondylolisthesis, J. Bone & Joint Surg. n.s. 13:39-48 [Jan.] 1931.*)

undergone thyroidectomy, excision of an exostosis of the foot, prostatectomy and numerous extractions of teeth. Twenty years after fusion of the spinal column he was pitching hay and doing farm work. Apparently he had good function of his back.

It is also conceivable that spondylolisthesis could occur during childbirth. When


a
b
c
d

severe trauma in the lumbar part of the spinal column has occurred, especially with the spinal column hyperextended, and roentgenograms disclose fracture through the pars interarticularis, with forward slipping of the fifth lumbar vertebra, a diagnosis of *traumatic spondylolisthesis* is justifiable. Roentgenograms seldom are available previous to injury of the spinal column and opinions derived from examination of anteroposterior views alone are of little or no value because the displacement of the vertebra seldom is recognized in such views.

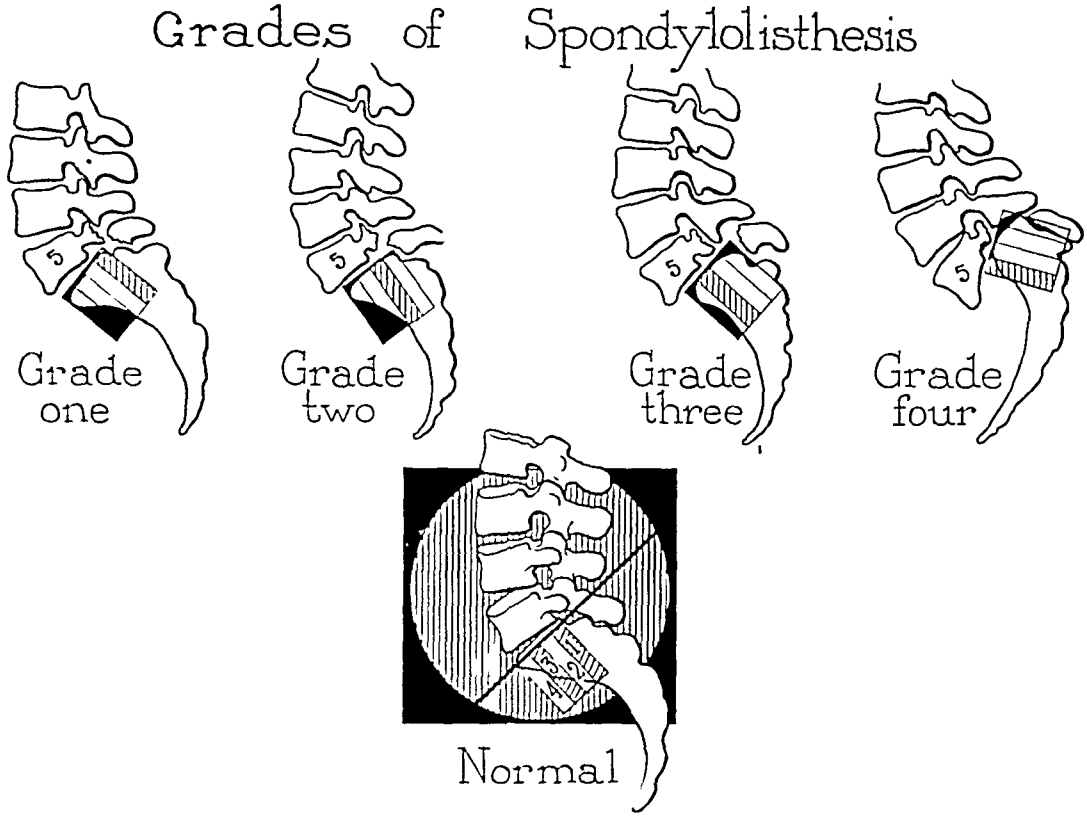


Fig. 4.—Meyerding classification and gradation of degrees of slipping of vertebra in cases of spondylolisthesis. *Grade 1*, a vertebra has slipped one-fourth of the distance of the interspace. *Grade 2*, a vertebra has slipped one-half of the distance of the interspace. *Grade 3*, a vertebra has slipped three-fourths of the distance of the interspace. *Grade 4*, a vertebra has slipped to the edge of the interspace. When the vertebra has slipped in front of the sacrum it is classed as *Grade 4 with anterior dislocation;* the rounded anterior edge of the sacrum is the result of grinding of the edges of the bone. When a vertebra is displaced backward it is called *reversed spondylolisthesis.* When defects, such as spina bifida, anomalies of the facets or separation of the pars interarticularis are diagnosed on the basis of oblique roentgenograms or at operation, it is well to record such data as to site. *Spondylosclisis* is a congenital fissure of the vertebral arch and is smooth-edged. When fracture occurs, roentgenograms taken soon after the injury may show irregular edges, and later, at operation, a fibrous mass or band may be present at the pars interarticularis. I call this *separation of the neural arch*. *Spondylolysis* is a defect in the development of the neural arch, with separation at the pedicle. The term *prespondylolisthesis* is used when a congenital bilateral defect exists in the neural arches at the pedicles but the body of the vertebra has not slipped forward. *Traumatic spondylolisthesis* may occur together with fractures of the transverse process and so on. Thus, a diagnosis may be made of "traumatic spondylolisthesis of the fifth lumbar vertebra, Grade 2, with a sacral spina bifida and fracture of the pars interarticularis," and so on. *(Reproduced, with permission of the publishers, from Meyerding, H. W. Spondylolisthesis as an Etiologic Factor in Backache. J.A.M.A. 111:1971-1976 [Nov. 26] 1938.)*

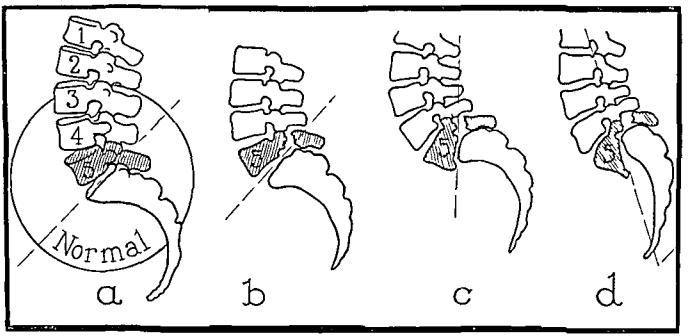


Fig 5.—Variations in the lumbosacral angle made from tracings over roentgenograms to show the normal status and the marked degree of change occurring in spondylolisthesis, *a*, normal lumbosacral angle, *b* Grade 2 spondylolisthesis with separation of the pars interarticularis and no change in the lumbosacral angle, *c*, Grade 3 spondylolisthesis with separation of the pars interarticularis, the lumbosacral angle is now perpendicular and the sacral promontory has become rounded off, *d*, Grade 4 spondylolisthesis with wider separation of the spinous process and lamina, the fifth lumbar vertebra has become displaced anteriorly and downward to the sacrum, and the lumbosacral angle is reversed In the normal relation shown in *a*, the inferior articular facet hooks over the sacral facet to give stability and to prevent slipping on the intervertebral disc on which the spine rests In *b* the support normally afforded by the lumbosacral facets is lost owing to the separation of the neural arch at the pars interarticularis and the fifth lumbar vertebra has slipped forward, the normal skeletal support has been lost and ligamentous structures become stretched under stress and trauma In *c* there is no longer any skeletal support, and all weight and strain are on the ligamentous structures In *d* the lumbosacral angle is reversed and the fifth lumbar vertebra has lost all useful skeletal contact in supporting the weight of the body (*Modified and reproduced, with permission of the publisher from Meyerding, H W Spondylolisthesis as an Etiologic Factor in Backache, J A M A 111 1971-1976 [Nov 26] 1938*)

Fig 6.—Anterior, lateral and posterior views of a patient who had Grade 4 spondylolisthesis and forward dislocation

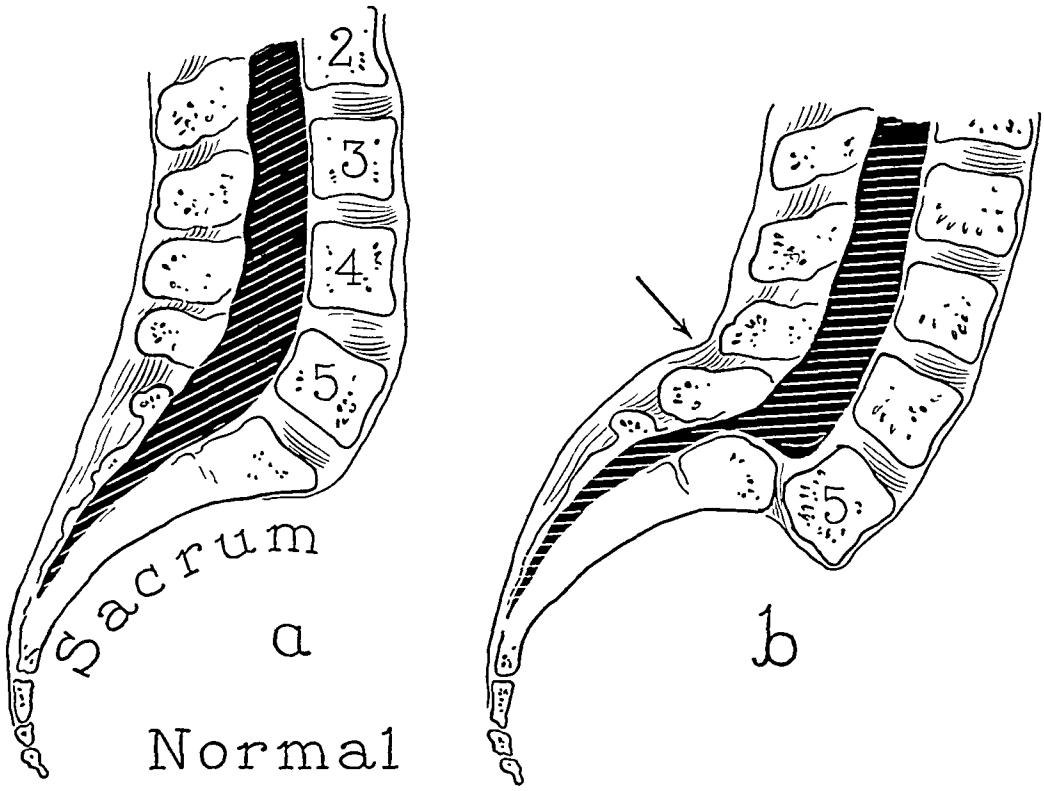


Fig. 7.—In *a*, normal relation of the spinal canal in the lumbosacral area, in the sagittal section. In *b*, narrowing and elongation of the spinal canal in the presence of Grade 4 spondylolisthesis, in sagittal section. (*Modified and reproduced with the permission of the publisher, from: Meyerding, H. W.: Spondylolisthesis as an Etiologic Factor in Backache, J.A.M.A. 111:1971-1976 [Nov. 26] 1938.*) Apparently the spinal canal can sustain displacement of the fifth lumbar vertebra on the sacrum without the production of serious symptoms from pressure on nerve roots.

ILLUSTRATIVE CASE 2 *(demonstrating the need for adequate roentgenograms).*—I was present and watching men working in a deep excavation when suddenly a huge steel scoop swung into the pit. A man working stooped over and was struck in the back and knocked to the ground. With the assistance of fellow workmen he was able to walk away. Several hours later, while visiting a surgeon, I was asked to see a patient who had sustained an acute injury to the back. I was shown an anteroposterior roentgenogram that had been considered to show nothing of significance. There were no local signs of discoloration except slight swelling and tenderness, with limitation of spinal movement. The roentgenogram was not clear, but I suspected traumatic separation of the neural arch, and I asked for lateral and three-quarter views. It was obvious that the surgeon was annoyed at such a request, but

Fig. 8 (*opposite*).—In *a* (preoperative anteroposterior roentgenogram in the sixth case), spina bifida of the fifth lumbar vertebra and the sacrum; the separation at the pars interarticularis is not clearly shown. In *b* (preoperative lateral roentgenogram), slight forward slipping of the fifth lumbar vertebra on the sacrum; there is evidence of separation of the neural arch. In *c* (postoperative anteroposterior roentgenogram), the two massive bone grafts taken from the tibia and placed on either side of the spinous processes of the fourth and fifth lumbar vertebrae and the upper two segments of the sacrum. The angle of the grafts makes them appear not to extend far enough onto the sacrum, but in the lateral view it is obvious that they do. In *d* (postoperative lateral roentgenogram taken four months after the operation), the two autogenous grafts are in good position and apparently are producing firm fusion. The separation and altered angulation in the neural arch are distinct and have resulted from the forward slipping of the fifth lumbar vertebra with the pedicles, transverse processes and superior articular facet, while the inferior facet, lamina and spinous process remain behind.

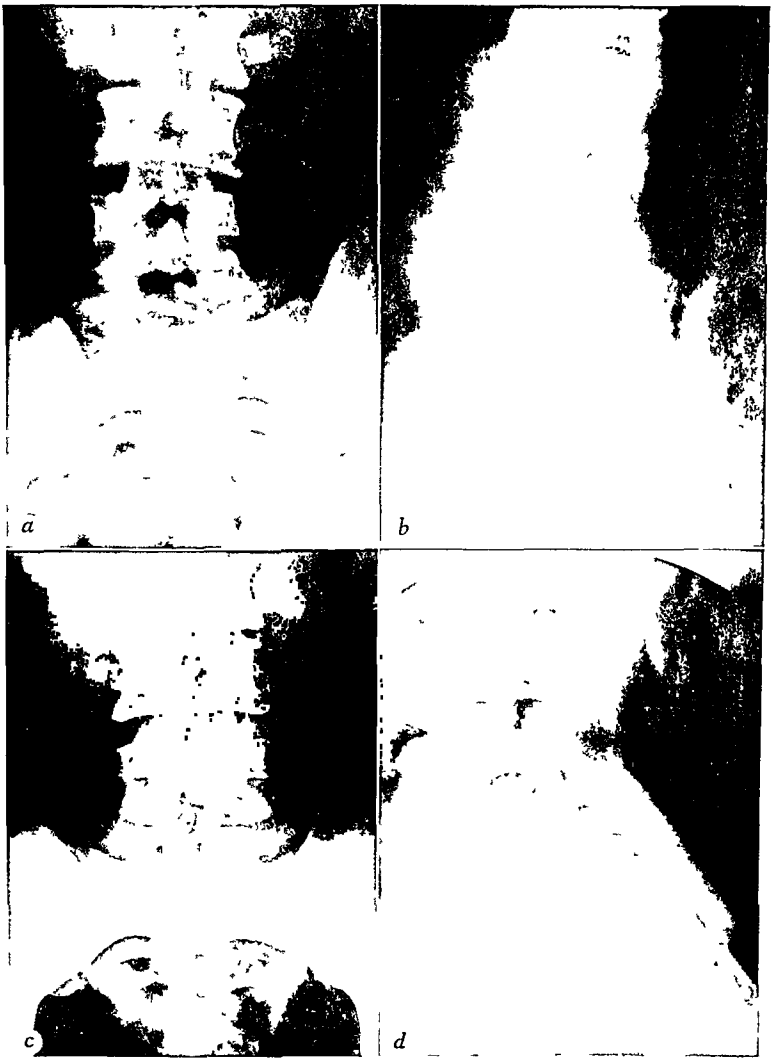

a
b
c
d

Fig. 9.—In *a* (anteroposterior roentgenogram of the patient in the seventh case), two bone grafts placed on either side of the eroded spinous processes and lamina and extending from the third lumbar vertebra onto the sacrum. In *b* (lateral roentgenogram), the defect in the pars interarticularis, with slight forward displacement of the body of the fifth lumbar vertebra on the sacrum. The bone grafts are in good position, and firm fusion is taking place five months after the operation.

when the new roentgenograms showed Grade 1 spondylolisthesis and separation at the pars interarticularis he was amazed and said, "It is the first instance of spondylolisthesis I have seen." I told him that the first time I sent a patient to have a lateral roentgenogram taken the roentgenologist refused to take it, saying "That is foolish." When the roentgenograms were made by another roentgenologist, however, and showed spondylolisthesis, the first roentgenologist acknowledged his error in judgment and thanked me, saying he had never seen the deformity before. This, of course, was many years ago.

Patients do not always recall having sustained injury at the time of examination, but later volunteer the information that they not only were injured but also were incapacitated. This occurs among both patients who seek compensation and those who do not. It is well for all surgeons to remember that a patient may have congenital defects of the lumbar part of the spinal column, and even spondylolisthesis, without being aware of them or experiencing symptoms. When disabling backache persists during occupational strain, the surgeon ought never to make a diagnosis of "malingering," without first excluding, by study of adequate roentgenograms, the displacement of spondylolisthesis.

ILLUSTRATIVE CASE 3 *(traumatic spondylolisthesis of the fourth lumbar vertebra, fracture of the pars interarticularis and spina bifida of the fifth lumbar vertebra diagnosed as malingering).**—A man 46 years old complained of backache and pain in both thighs after falling down a flight of steps seven months prior to consultation.

While he was under medical care, several months after the accident, he was operated

*This case was reported in 1931.[1]

upon for acute appendicitis and seemed improved after the operation Since he was unable to work, felt better when at rest and complained of severe pain when up and about, he was considered a malingerer, and was shown at a medical meeting as such Compensation was involved, and he was referred to the Mayo Clinic for an opinion

The patient was 6 feet (183 cm) tall and weighed 155 pounds (70 Kg), which was 25 pounds (11 Kg) underweight The blood pressure, temperature and pulse were normal He walked with a careful gait and held the muscles of the back rigid Tenderness and slight rigidity of the spinal column in the lumbar area were noted A slight prominence was observed at the level of the fourth lumbar vertebra, with a slight depression above it Spondylolisthesis was suspected Roentgenograms showed the fourth lumbar vertebra to be displaced forward on the fifth, separation of the pars interarticularis and spina bifida of the sacrum (Fig 2, *a* and *b*) were also detected As this paper is written it is twenty-nine years since I saw this patient and advised fusion He refused to undergo that procedure until he had seen the insurance company and the state compensation board He returned home wearing a lumbosacral support, which gave him some relief He was reexamined by members of the insurance company's medical staff, and orthopedic consultation was obtained He was awarded compensation and returned for operation about seven months later He made an uneventful convalescence after the operation and was discharged, wearing the lumbosacral support, on the forty eighth postoperative day Twelve years after the operation he reported that he was in excellent condition and working

In this case the period of disability and pain were prolonged and the patient was subjected to needless humiliation

In the years 1918 to 1940 inclusive, the diagnosis of spondylolisthesis was made for 881 patients at the Mayo Clinic I have published data on the age, sex and occupations of the patients, duration of symptoms, incidence of trauma, histories, disability, previous diagnoses and site and grade of deformity, and have stressed

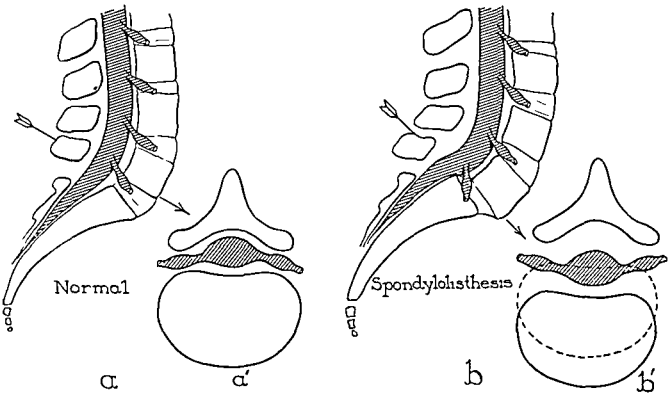


Fig 10—*Left*, normal relation of the cauda equina and the spinal column (*a* is in sagittal section and *a'* is in cross section) *Right*, relation of the cauda equina and the spinal column in the presence of spondylolisthesis Drawing *b* is a sagittal section, the body of the fifth lumbar vertebra slipped forward (Grade 2), the spinous process is displaced backward Drawing *b'* is a cross section (*Reproduced, with permission of the publisher, from Meyerding, H W Low Backache and Pain Associated With Spondylolisthesis and Protruded Intervertebral Disc Diagnosis and Treatment, J Bone & Joint Surg vol 23*)

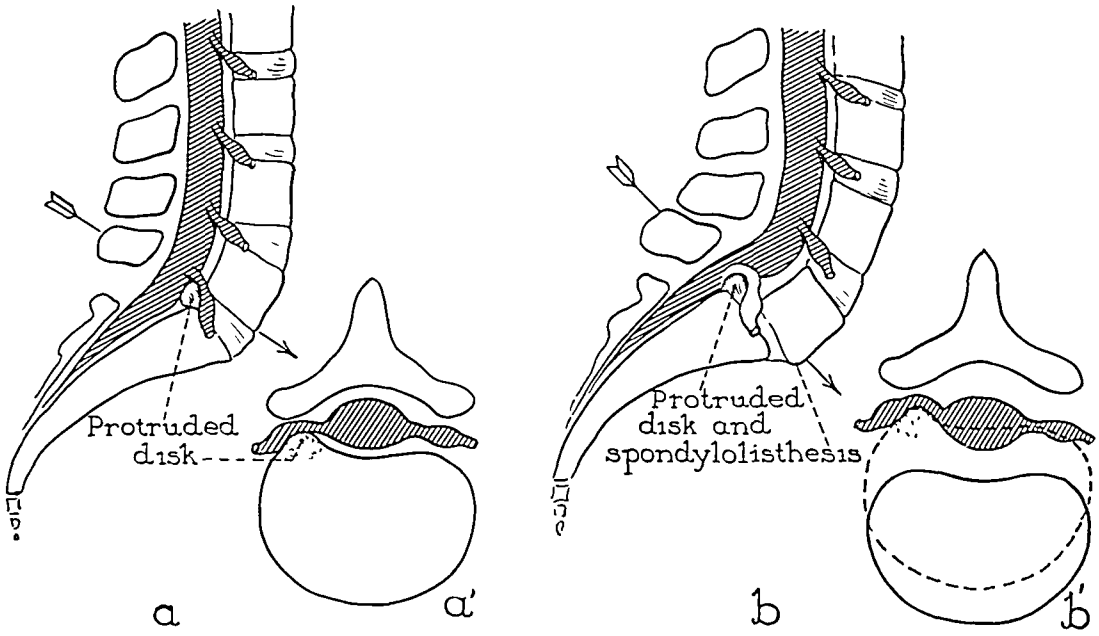


Fig. 11.—*Left*, relation of a protruded disc on the right side in the lumbosacral area impinging on the first sacral nerve, without spondylolisthesis. Drawing *a* is in sagittal section; drawing *a'* in cross section. *Right*, relation of the protruded disc on the right side impinging on the first sacral nerve root in the presence of Grade 2 spondylolisthesis (*b* is in sagittal section and *b'* is in cross section). In *b'* the protruded intervertebral disc has considerable room in which to prolapse and may not cause symptoms. (*Reproduced, with permission of the publisher, from Meyerding, H. W.: Low Backache and Sciatic Pain Associated With Spondylolisthesis and Protruded Intervertebral Disc: Incidence, Significance, and Treatment, J. Bone & Joint Surg. n.s. 23:461-470 [April] 1941.*)

the necessity of taking roentgenograms not only of the anteroposterior but in the lateral and oblique views. I have stressed the value of lateral roentgenograms, the prominence of the spinous process of the displaced vertebra, with the depression above caused by forward slipping of the spinal column, and the value of three-quarter views in showing the separation of the neural arch in the pars interarticularis. I have demonstrated that the vertebral body, with attached superior facet, is displaced forward and that the spinous process and inferior facet remain behind. The displacement of the vertebra may increase until the involved vertebra slips over the lip of the sacrum and lies anterior to it.

ILLUSTRATIVE CASE 4 (*progressive slipping of the fifth lumbar vertebra in spondylolisthesis, with paralysis of the cauda equina*).—A multipara 34 years old complained of numbness of the vagina, which had gradually increased over a period of two years. At the age of 15 years she had had severe pain in the calf of the right leg that was relieved by rest in bed, massage and the application of traction for two weeks; there had been no recurrence of pain in nineteen years. Roentgenograms which she had brought with her (Fig. 3, *a* and *b*) showed that Grade 4 spondylolisthesis of the fifth lumbar vertebra, with the posterior edge of the vertebra resting on the anterior lip of the sacrum, existed in May 1929. Roentgenograms taken by an eminent roentgenologist in May 1936, were reported to show "high-grade spondylolisthesis with the fifth lumbar displaced full width and downward width of one vertebral body. Pregnancy; fetal skeleton appears normal, conjugate barely 10 cm., lateral measurement normal."

The patient had been treated for trichomoniasis and had undergone an operation for cystocele thirteen months before she came for consultation at the Mayo Clinic. Incontinence of urine occurred when she coughed, sneezed or laughed, and she had noticed a feeling of

heaviness in the pelvis For the six months prior to her visit to the clinic she had had occasional incontinence of the bowels After exercise the sensation of numbness in the vagina, rectum and buttocks increased She had noticed that the right hip appeared to be more prominent than the left and that the right great toe stood up There had been no pain in the legs, and she walked without a limp She did not have backache She played golf and rode a horse She had consulted excellent orthopedists, neurologists and neurologic surgeons and had been advised both to undergo fusion of the spinal column and not to undergo such a procedure The neurologists had advised against operation, and she had come to the clinic for further assistance

In November 1946, examination showed an apparently healthy woman, 5 feet and 1½ inches (155 cm) tall, weighing 105 pounds (47 6 Kg) There was a marked deformity in the lumbosacral area, with a prominent sacrum and lordosis in the lumbar portion of the spinal column, the right side of the pelvis was high, and there was a listing of the body to the left Roentgenograms showed the fifth

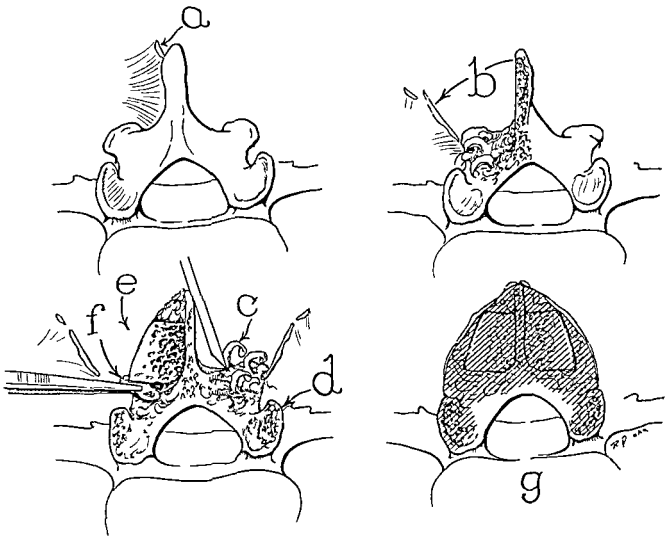


Fig 12.—Operative procedures employed by author to produce strong bony fusion of the third, fourth and fifth lumbar vertebrae and the sacrum In sketch *a* the tip of the spinous process and its ligamentous attachments are reflected In sketch *b* the lateral bony surfaces of the spinous process and its ligamentous attachments are reflected laterally At point *c* the posterior surfaces of the lamina are roughened and bone chips are turned up with a sharp gouge, the interspinous ligaments are removed, and the edges of the spinous processes are roughened by turning bone chips away from the processes At point *d* the interarticular joint surfaces of the facets are destroyed by curet and bone chips are inserted At point *e* two massive tibial grafts are inserted in the trough of freshened lamina and spinous processes and extend from the third lumbar vertebra onto the third sacral segment At point *f* multiple bone shavings and cancellous bone taken from the tibia are inserted about the tibial grafts to ensure contact between the grafts, the lamina and the spinous processes In sketch *g* the two massive bone grafts have been crushed together so as to fill the interspinous and lamina spaces and make better contact with the multiple bone shavings and chips (*Reproduced, with permission of the publisher, from Meyerding, H W Spondylolisthesis Surgical Treatment and Results, J Bone & Joint Surg n s 25 65 77 [Jan] 1943*)

lumbar vertebra to be displaced forward and downward, so that it lay in front of the second sacral segment (Fig. 3, *c* and *d*).

The condition was Grade 4 spondylolisthesis with complete displacement. The sacrum appeared to be rounded off on its upper surface. The superior articular facet lay in front of the sacrum, with the fourth spinous process resting on it and the sacrum; the spinous process of the fifth lumbar process was displaced backward on the sacrum. Roentgenograms of the thorax disclosed no abnormality. The physical examination showed some degree of pes cavus and atrophy of the small muscles in the plantar muscle of the feet. Knee jerks and anal reflexes were absent, and the neurologist suggested that paralysis of the cauda equina was present. It was speculated that the positive signs perhaps were related only indirectly to the spondylolisthesis; that is, that possibly an associated anomaly of the spinal cord was at hand. The neurologic surgeon expressed the opinion that "the main indication is fusion of the spine, but the cauda equina should be explored at the same time."

The patient reported for an opinion, and having received it, returned home.

The methods employed in surgical fusion of the spinal column have undergone many alterations in technic and materials. Anterior and posterior approaches have been used; the latter is, in my own opinion, safer, as well as adequate for the treatment of all degrees of displacement. Autogenous fresh bone, homogenous and heterogenous bone, used as massive, single or double grafts, and multiple or granulated bone have been inserted in the prepared areas for fusion. Bone preserved by freezing and chemical sterilization has

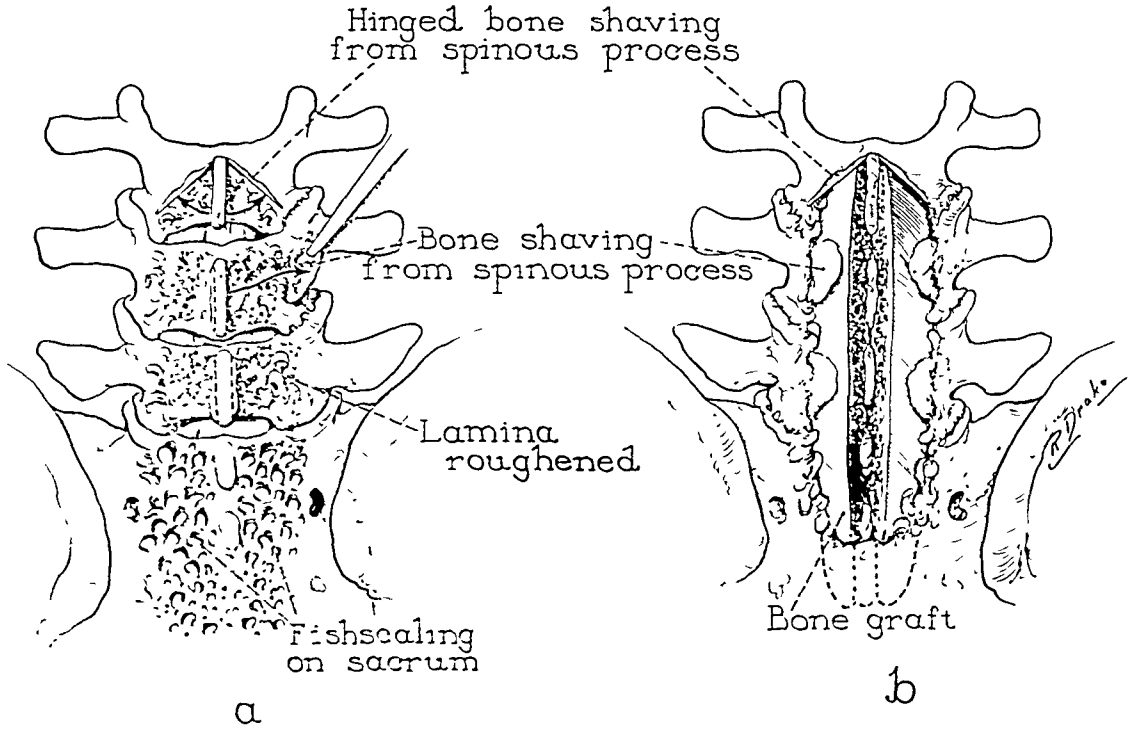


Fig. 13.—Sketch *a*, posterior view, showing the trough ready for insertion of the massive tibial grafts. Sketch *b*, tibial grafts inserted and crushed together, forcing the cancellous bone of the grafts together, filling the interspinous spaces and making contact with the shavings and bone chips of the spinous processes and the sacrum. The interarticular facets have been curetted to destroy the articular surfaces, and bone chips have been inserted and cancellous bone placed about. The tibial grafts make a broad contact with the fish-scaled sacrum and extend onto the third sacral segment. (*Reproduced, with permission of the publisher, from Meyerding, H. W.: Spondylolisthesis: Surgical Treatment and Results, J. Bone & Joint Surg. n.s. 25:65-77 [Jan.] 1943.*)

proved successful as grafting material[2]

In 1930 I read a paper before the American Orthopaedic Association on spondylolisthesis[1] and in 1942 another on "Spondylolisthesis Surgical Treatment and Results,"[3] in which I discussed the method employed to produce firm fusion of the lumbosacral area and included statistical data The operative technic has been modified with further experience and has given most satisfactory results in relieving symptoms and returning the disabled to useful employment Space does not permit a more exhaustive discussion of the subject, and a list of interesting papers is appended

In another series of 583 patients with spondylolisthesis, which I reported at the meeting of the American Medical Association in 1938,[4] the average age was 40 3 years for male and 43 5 years for female patients The oldest was 80 years old and the youngest 11 years, the average duration of symptoms was seven and one half years, 80 per cent of the patients complained principally of backache, 10 per cent had no complaint of backache, and spondylolisthesis was discovered incidentally during routine examinations Pain in the legs was a complaint of 7 7 per cent, deformity, stiffness or paralysis affected 2 per cent Only 7 per cent had had a previous diagnosis Hard occupational work was recorded for 70 per cent of the patients, and 70 per cent of patients with spondylolisthesis were male Hence, the early teaching that the deformity is more common in the female than in the male sex is contradicted The strain of the laborer has supplanted the labor of pregnancy as a possible etiologic factor

Spondylolisthesis may occur in the cervical, the thoracic or the lumbar portion of the spinal column Most commonly it is a forward displacement of the fifth lumbar vertebra on the sacrum, when a posterior displacement occurs, it is known as

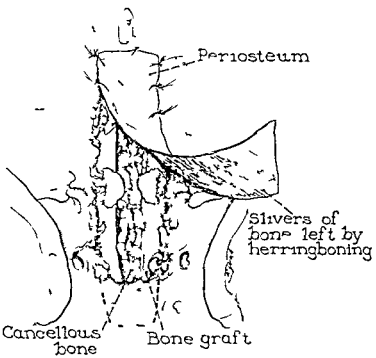


Fig 14—An osteoperiosteal tibial graft being sutured over the lumbosacral bone grafted area the periosteum is removed by use of a sharp 1 cm (3/8 inch) chisel held at an angle of 80 degrees which is rapidly twisted as it is forced along the flat surface of the tibia Multiple small bone fragments remain attached to the periosteum and when employed thus convert the operative bone graft area into a tube surrounded by bone I do not routinely employ this osteoperiosteal graft but have found it useful in operations in which great deformity exists (*Reproduced with permission of the publisher from Meyerding H W Spondylolisthesis Surgical Treatment and Results J Bone & Joint Surg n s 25 65 77 [Jan] 1943*)

reversed spondylolisthesis I have employed a classification of degrees of displacement, which is shown in Figure 4

Tracings of the lumbosacral angle (Fig 5) in the presence of spondylolisthesis vary greatly from normal (*a*) to slight (*b*), the angle of the joint may be vertical (*c*) or reversed (*d*) and may show 60 degrees of variation from the normal Thus, all the skeletal support for the superimposed weight of the body may be lacking when Grade 4 spondylolisthesis is present, with forward dislocation The abnormal relation of the lumbar part of the spinal column and the sacrum produces a prominence of the sacrum and the spinous process of the fifth lumbar vertebra with a

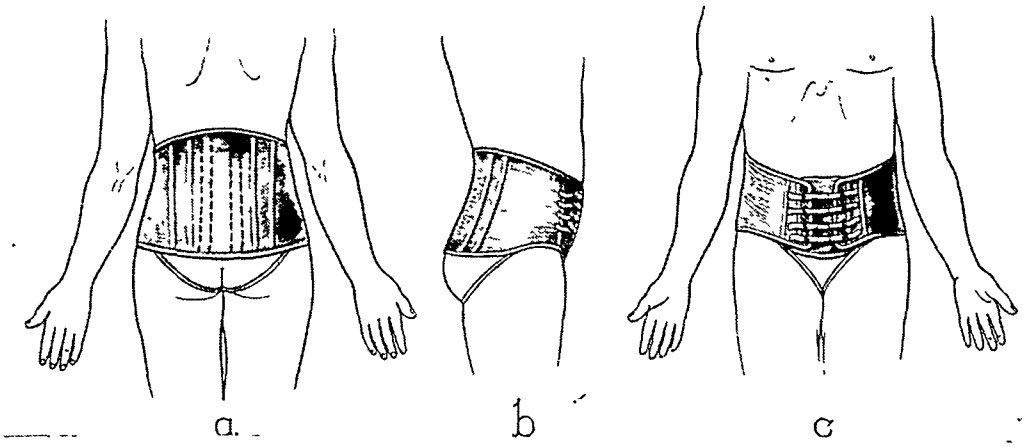


Fig. 15.—A reinforced leather lumbosacral support shown in front, side and back views.

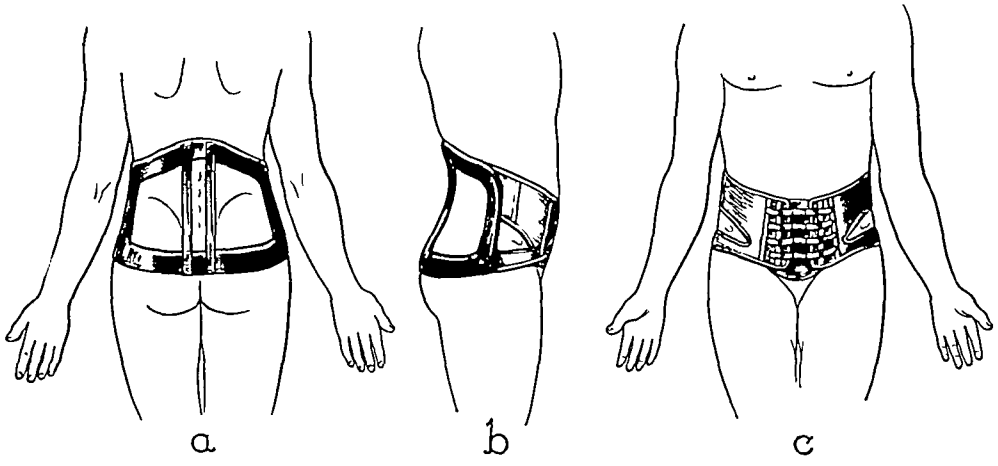


Fig. 16.—A rigid rocking-chair type of lumbosacral support that provides increased ventilation and does not cause irritation of the skin at the iliac crests; shown in front, side and back views. (*Reproduced, with permission of the publisher, from Meyerding, H. W.: Spondylolisthesis as an Etiologic Factor in Backache, J.A.M.A. 111:1971-1976 [Nov. 26] 1938.*)

depression or lordosis in the lumbar area; the whole torso is displaced forward and downward, sinking into the pelvis (Fig. 6). For such degrees of deformity the surgeon must plan the operation of fusion so as to produce a firm, strong mass of bone that will hold the sacrum and the lumbar part of the spinal column in ankylosis.

When a patient is encountered who has undergone severe trauma, it is well to remember that spondylolisthesis may be associated with fractures of the transverse process or the spinous processes or with fractures of the vertebral body. Fracture of the pars interarticularis usually is present, as is crushing of the intervertebral space, with resulting protrusion of the disk and narrowing of the lumbosacral interspace. Root irritation arising from a disk or fibrous hyperplasia from the site of fracture of the neural arch may give rise subsequently to referred pain in the legs and back, or even paralysis, paresthesias and the like. Such symptoms may result immediately after trauma or at a later

date, and may involve a disk situated either above or below the site of spondylolisthesis Traction exerted by means of adhesive tape or pins passed through the supracondylar areas of the femurs, with the legs suspended from an overhead frame and with the knees flexed, may be employed immediately after injury, with beneficial results and amelioration or reduction of the displacement when a fusion operation is indicated I have had patients with a history of appendicitis who required appendectomy after treatment for traumatic spondylolisthesis

ILLUSTRATIVE CASE 5 *(traumatic spondylolisthesis with Grade 2 deformity, fractures of the second, third, fourth and fifth left transverse processes and traumatic myelitis)* —A man 22 years old was struck by a falling tree Immediately disabled, he was taken to a hospital Roentgenograms were taken, and a diagnosis of fractured left spinous processes with traumatic myelitis was made The patient required catheterization for four weeks and had paralysis of the legs Three weeks after the injury a plaster of paris body cast was applied, but this was removed after a week because the patient required appendectomy At the end of ten weeks he had improved enough to leave the hospital but was unable to work Additional roentgenograms taken a week before his admission to the Mayo Clinic showed a displaced vertebra, and he came for advice and treatment

Examination showed a prominence of the spinous process of the fifth lumbar vertebra and a slight depression above it There was some stiffness of the spinal column, especially on forward bending Neurologic examination disclosed anesthesia over the lower sacral area Roentgenograms showed spondylolisthesis of the fifth lumbar vertebra, Grade 2, fractures of the second, third, fourth and fifth left transverse processes and narrowing of the lumbosacral interspace and the spinous process of the fourth lumbar vertebra, which was crushed against the fifth, with an apparent fracture through the pars interarticularis

Operation was performed according to the Meyerding technic, and two heavy tibial grafts were inserted from the level of the third lumbar vertebra onto the sacrum Convalescence was uneventful, and the patient was given a lumbosacral support and dismissed, after being advised not to do any heavy work for six months At intervals of five and ten years after the operation he reported that he was working as a machinist and had no trouble with his back

As the anterior portion, consisting of the vertebral body, the pedicles, the transverse processes and the superior facet slips forward, the posterior portion, consisting of the lamina, the spinous process and the inferior facet, remains behind At rectal palpation or proctoscopic examination in the presence of displacement of Grades 3 and 4 (especially Grade 4, if complete dislocation has occurred), the bony mass is readily detected, because it projects into the pelvis and in a woman narrows the birth canal (Fig 7) Separation of the neural arch takes place at the isthmus in the area of the pars interarticularis The loose spinous process, with its remaining attachments, can be moved freely and is sometimes removed at operation I do not remove it routinely, nor, in my opinion, are the symptoms of spondylolisthesis relieved by this practice

There is no question of the value of surgical fusion for spondylolisthesis It is recognized that the forward displacement deformity may increase in time under the stress and strain of occupation, obesity, pregnancy or sudden severe trauma Although I have observed patients without symptoms but with definite physical signs of deformity, as verified in roentgenograms, I know that pain and disability often follow strain or trauma Fusion should be done before marked deformity, backache or paralysis results, the operation is then more easily accomplished and more likely to be successful in relieving the symptoms and returning the patient to his usual employment When all patients with persistent backache have the benefit of anteroposterior and lateral roentgenograms, the diagnosis will be made earlier and the results of surgical treatment will be improved

Recognition of defects in the neural arch, such as separation of the pars interarticularis and absence of the articular facets, as demonstrated in routine roentgenograms, should call for reexamination later, to see whether additional slipping of the vertebrae involved has occurred. In a survey of 400 school children in the first grade, Baker and McHolick noted that 4.5 per cent of children whose parents had roentgenologic evidence of spondylolisthesis also had the deformity; and in 7 families with 16 children, the parents of whom had evidence of spondylolisthesis, 8 children also had the deformity. Further studies of the hereditary factor are being made.[5]

ILLUSTRATIVE CASE 6 *(spondylolisthesis, Grade 1, of the fifth lumbar vertebra with spina bifida occulta of the sacrum and fifth lumbar vertebra, treated by fusion of the fourth and fifth lumbar vertebrae and the upper two segments of the sacrum).*—A man 26 years old complained of weakness of the back that had been present all his life and of backache and pain, extending into the legs, that had been present during the two years prior to his visit to the clinic. As a traveling man he had driven an automobile for two years; thinking that a change of occupation might relieve his symptoms, he took a position that permitted him to sit at a desk, but obtained no benefit therefrom.

A diagnosis of Grade 1 spondylolisthesis and spina bifida occulta of the sacrum was made (Fig. 8). The neurologist had not detected neurologic signs. Operation was performed by the Meyerding technic in 1932, twenty-four years prior to the time of this report. Convalescence was uneventful, and the patient left the hospital, wearing a lumbosacral support, on the forty-sixth postoperative day. Since the displacement was slight (Grade 1), it was considered that fusion of the fourth, fifth and upper two segments of the sacrum would provide sufficient skeletal support. Nine years after

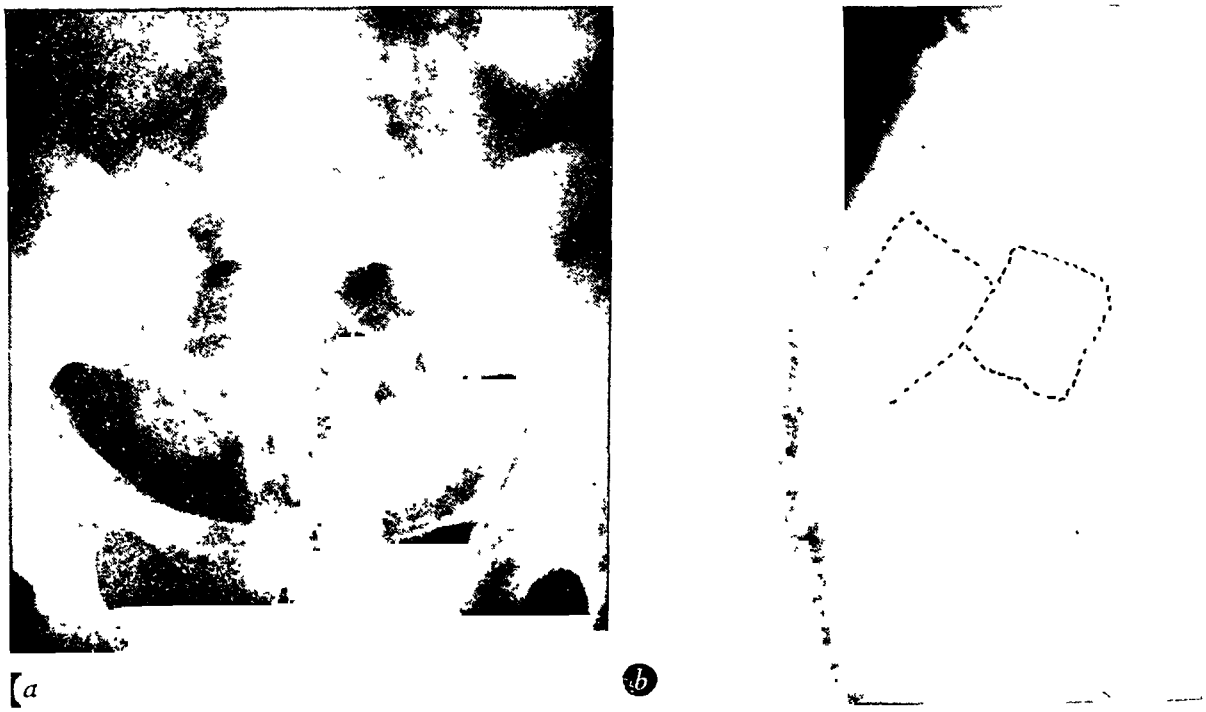


Fig. 17.—*Left*, anteroposterior roentgenogram (*a*) showing the two bone grafts from the tibia in good position, and including the third, fourth and fifth lumbar vertebrae and the first and second sacral segments. The roentgenogram was taken by the home physician five and one-half months after the operation and was sent to us. *Right*, lateral roentgenogram (*b*) taken five and one-half months after the operation, showing the lumbosacral area undergoing fusion.

the operation the patient reported that his back did not trouble him and that he was working

In this case occupational driving of an automobile for long hours aggravated backache, and the patient's change to desk work failed to give relief Fusion of the fourth and fifth lumbar segments and the sacral portion of the spinal column has relieved the symptoms that had troubled him for more than a quarter of a century

Stewart,[6] in the study of 800 skeletons collected in Alaska, observed that 207 of 786, or 26 3 per cent, had defects of the neural arch, and that the incidence increased with age It has always been my opinion that orthopedists do not appreciate sufficiently the importance of ligamentous support in the lumbosacral area and do not emphasize what is apparent in roentgenograms Instability results when the strong ligamentous supports fail to hold the inferior articular process from slipping over or about the superior articular process of the sacrum The articular facets of the vertebrae become involved by spondylitis and may become ankylosed I once observed this condition in a section of the spinal column of an elk,* and it suggested to me the method of curetting out the articular surfaces and inserting small chips of bone which are incorporated in fusion operations I am convinced that this is a worth-while procedure

Chronic arthritis is the disease most commonly associated with spondylolisthesis Narrowing of the lumbosacral interspace, with hypertrophic lipping and a destructive involvement of the facets, may permit slight forward displacement of the vertebral body

ILLUSTRATIVE CASE 7 *(chronic arthritis complicating spondylolisthesis in a patient claiming workman's compensation)* —A telephone lineman 45 years old came to the Mayo Clinic because of disability of fifteen months' duration, caused by severe backache that was relieved by rest in bed He had had symptoms of rheumatism for some time At the time of examination he did not mention injury, but later he recalled that he had had backache several times in the previous twenty years Examination showed a slight prominence of the fifth spinous process and a depression above it, there was some stiffness of the spinal column Roentgenograms showed Grade 1 spondylolisthesis of the fifth lumbar vertebra, with separation of the neural arch The results of neurologic examination were negative The patient was advised to undergo a fusion operation and treatment for arthritis, the sacroiliac joint, in roentgenograms, appeared to be sclerotic Since he did not wish to undergo an operation at the time, he returned home wearing a back support and expecting to return later for operation He returned about two and one-half months later and was operated upon A fusion operation was done, with the use of two massive tibial bone grafts and so on, according to the Meyerding method (Fig 9) Convalescence was uneventful The patient felt improved and returned home, wearing a support to the spinal column but still having rheumatic aches and pains Some five months later he requested that an explanatory letter be sent to his company, because he recalled that "while at work, he had lifted a 75 pound ladder, slipped and twisted his back, and had had instant backache and disability since"

About seven years after the operation it was observed that the grafts were firmly fused and that the patient had been working at his usual occupation, nevertheless he asked that another explanatory letter be sent to his company, because he found climbing telephone poles too strenuous At this time extensive sclerosis was observed about the sacroiliac area In my opinion his request was justified and he took up a lighter form of work He was not a malingerer

The coexistence of spondylolisthesis and protrusion of an intervertebral disk should be considered when sciatic pain occurs in addition to backache At the scientific session of the American Academy of Orthopaedic Surgery in 1939 my associates and I presented an exhibit that illustrated the various complications requiring fusion of the vertebral column in t of protrusion of an interver 1941 I consider ci

*A former patient of mine found the spinal column of an elk and noticed that it was rigid as a result of bony union of the interarticular facets but the bodies of the vertebrae were separated ½ inch (1 27 cm) The fusion could not be broken manually or when fixed in a vise I therefore concluded that it would be possible to give added support to the spinal column by fusion of the facets and have employed this technic routinely

cance and treatment of protrusion of an intervertebral disk associated with spondylolisthesis.[8] Much has been written since, and it appears that there is still considerable difference of opinion as to the indications for fusion and the removal of protruded disks. It has been my practice to have a neurologist examine all patients who present symptoms of root irritation before fusion is performed for spondylolisthesis. At operation, when indicated, I have the neurosurgeon remove the disk and examine the nerve roots. The orthopedic surgeon then inserts the bone grafts and so on. I call this the "combined operation."[9] Close cooperation of the examining physician, the roentgenologist, the neurosurgeon and the orthopedist has shown that the incidence of protrusion of intervertebral disks in association with spondylolisthesis is apparently increasing.

In a personal communication, Dr. J. Grafton Love wrote: "When a patient with spondylolisthesis has back pain *only*, a bone-graft fusion may be and usually is sufficient for relief. However, if there is, in addition to the low back pain, a complaint of pain characteristic of root pain in the distribution of the sciatic nerve, then a preoperative myelogram and examination of the cerebrospinal fluid for total protein content should be made. An increased value for total protein in the cerebrospinal fluid should lead to surgical exploration of the fifth lumbar and first sacral nerve roots prior to fusion, even if the myelogram fails to reveal a defect characteristic of a protruded intervertebral disk. Sometimes protrusion of an intervertebral disk may be found associated with the spondylolisthesis (Figs. 10 and 11). The protrusion may involve the disk above the site of the bony lesion or the one *below*, if the spondylolisthesis is due to a forward displacement of the fourth lumbar vertebra on the fifth, or the fifth on the sacrum. If no protruded disk is found, the surgeon should look carefully for compression of a nerve root or roots by the loose neural arch, or a bit of fibrocartilage which sometimes compresses the involved nerve root at its foramen of exit from the spinal canal. The enlarged, displaced, hyperirritable congested nerve root should be thoroughly decompressed before the bone graft is applied across the involved interspace."

Some of the indications that surgeons consider in advising the combined operation in cases of protrusion of an intervertebral disk are lumbosacral arthritis with narrowing of the interspace, chronic backache which is relieved by rest and aggravated by activity; defects such as spina bifida occulta; separation of the neural arch; congenital or acquired deformities in the lumbosacral area; abnormal mobility of the lower part of the lumbar area of the spinal column, or looseness of the posterior segment of the neural arch. I do not *routinely* remove the latter, as has been advocated, because my opinion is that by allowing it to remain I gain additional viable bone, which will aid fusion. A fibrous mass may form at the site of the separated pars interarticularis and cause

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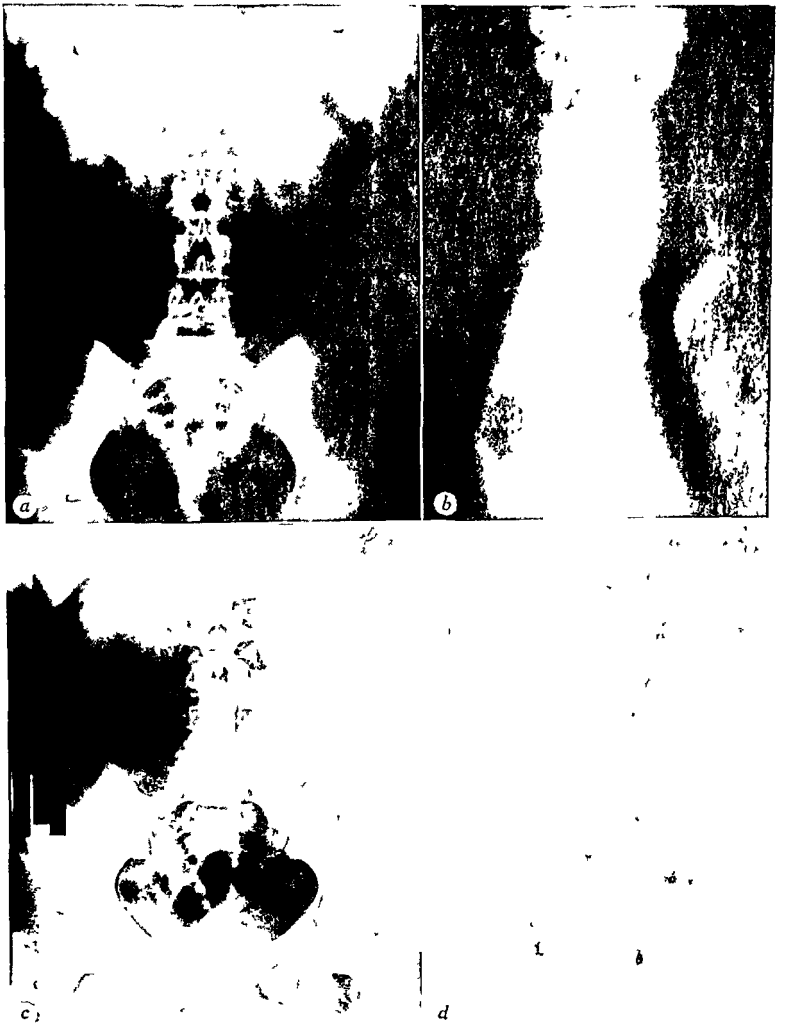
Fig. 18 (*opposite*).—Preoperative anteroposterior roentgenogram (*a*) in the ninth illustrative case, showing increased density where the roentgen rays passed through the fifth lumbar vertebra and the sacrum. Preoperative lateral roentgenogram (*b*), showing Grade 4 spondylolisthesis, with forward and downward displacement of the body of the fifth lumbar vertebra. Separation of the neural arch has left the spinous process and lamina posterior to the sacrum. Postoperative anteroposterior roentgenogram (*c*) showing that fusion, two and one-half years later, is complete. Lateral roentgenogram (*d*) taken four and one-half years after the operation, in which fusion was obtained by the use of two massive bone grafts from the tibia and by multiple bone shavings and chips. (*Reproduced, with permission of the publishers, from Meyerding, H. W.: Spondylolisthesis, J. Bone & Joint Surg. n.s. 13:39-48 [Jan.] 1931.*)


a
b
c
d

compression irritation of the nerve roots or adhesions. Should this develop, it would constitute an indication for excision of the posterior loose fragment and fibrous tissue, followed by decompression of the fifth lumbar and first sacral nerve roots.[10]

MEYERDING METHOD OF SPINAL FUSION THROUGH A POSTERIOR APPROACH, WITH ARTHRODESIS OF THE INTERARTICULAR VERTEBRAL FACETS AND USE OF MASSIVE BONE GRAFTS AND BONE FRAGMENTS.—The technic of the operation I employ is designed to create a tube or trough, surrounded by viable bone fragments, extending from the third lumbar spinous process to the third sacral segment of the sacrum, with arthrectomy of the interarticular facets and the insertion of two massive bone grafts and cancellous bone and chips of bone from the tibia.

A straight incision in the skin along the right side of the spinous processes (1 cm.) with retraction allows the freeing of multiple bone chips from the tips of the spinous processes, with the attachments of the soft tissues (Fig. 12 *a*). With a thin, sharp chisel the lateral, superior and inferior surfaces of the spinous processes are turned aside with bone and soft tissue attachments (Fig. 12, *b* and *c*), and the posterior surface of the lamina is similarly eroded and, with shavings of curled bone, is left attached. The interarticular vertebral articulations (facets) are destroyed with a very small curet, a special curved saw or a chisel of my own design (Fig. 12 *d*), and the interspaces are then packed with cancellous bone and small bone chips. The sacrum is "fish-scaled" by turning up numerous fragments of bone still attached, after the ligamentous attachments with bone particles have been displaced to the side (Fig. 13 *a*).

It is my practice to hinge the lateral bone fragments of the upper vertebra to be fused, so that the massive grafts can be forced under them to assure better fixation (Fig. 13 *b*). The massive bone graft, usually 9 or 10 inches (23 to 25 cm.) long and about ½ inch (1.27 cm.) wide, long enough when divided into equal lengths to include the third lumbar vertebra and two segments of the sacrum, is cut so as to fit as nearly as possible the involved lumbosacral curve. They are then removed with an electric saw. The exact length and curves to be grafted are marked out, and the long tibial graft is divided into two lengths, care being taken to preserve all attached cancellous bone. In fitting the two grafts into the prepared trough at the lumbosacral area it often becomes obvious that close contact at the site cannot be attained. When this occurs, the spaces that are apparent must be filled with numerous cortical chips and cancellous bone, so that when the massive grafts have been crushed together with a strong, large bone holder, the interspinous spaces will be filled to their bases and the grafts will make contact. I take many pieces of bone of various shapes and cancellous bone from the upper third portion of the tibia and pack them about the grafts and the lamina (Fig. 13 *b*).

The grafted area now has hundreds of bone chips, some viable and attached to the soft tissues, which will enclose the massive grafts in a tube when the lumbodorsal fascia is sutured. Great care should be taken to see that all bleeding points are stopped before the grafts are inserted, because if a hematoma develops it may lead to drainage and infection. I never use wire or metallic fixation of the grafts and seldom employ absorbable sutures, depending, rather, on tight closure of the fascia and skin to hold the tube and its enclosed grafts fairly secure (Fig. 12 *g*).

Removal of Tibial Grafts and Periosteum.—For removal of tibial grafts I prefer a straight longitudinal incision, made along and ¼ inch (0.6 cm.) lateral to the anterior ridge; it should be extended an inch (2.5 cm.) beyond the desired length of the graft at either end. The skin, with the attached fascia, is retracted, so as to expose the periosteum, which is cut close to the anterior tibial ridge the full length of the incision and crosses laterally at the ends.

With a sharp chisel and beginning along the ridge, the periosteum and bone particles are raised from below upward. The chisel must be held firmly with both hands at an angle of 70 degrees and rapidly twisted 10 to 20 degrees while pressure is exerted firmly against the bone and the chisel is moved slowly upward along the flat tibial surface. By this means the periosteum is lifted and bone fragments remain attached to it, leaving the tibial surface roughened. I call this the "herringbone method," and use it when I wish to resuture the periosteum to close the bone cavity or to transplant it.

The periosteum and skin are not separated when only a tibial bone graft is desired or when the surgeon does not wish to leave the periosteum attached to the graft. I abandoned the practice of leaving the periosteum on the graft because I found that resuturing of the periosteum with a continuous fine absorbable

suture not only prevented leakage from the bone cavity but hastened the formation of a new cortex and consequently rapidly strengthened the weakened tibia

Part of the "herringboned" periosteum may be excised and sutured over the bone grafts with the bony side facing inward (Fig 14) or may be used to cover large defects in secondary operations in which much periosteum is present, with absence of bone and the smooth side is faced inward

A lead wire is useful for measuring the length and shape of the recipient bed This may be held against the skin to give the surgeon a better idea in which the grafts should be cut Where severe deformity is present it is necessary to fit a tibial graft into the defect by recourse to several sections of bone or grafts from both tibiae Sections of plaster of Paris splints are useful in shaping the grafts before they are inserted

[illegible]

70 per cent solution of ethyl alcohol and a [illegible] pad of sterile cotton The metal pouch takes up the oozing that commences immediately after the operation and, providing a cul, leaves an area which rapidly dries [illegible] exudate and seal the wound with a [illegible] bed [illegible] holds the cotton in place on the [illegible] is placed along the side and at the [illegible] between these to prevent the dressings from being displaced [illegible]

[illegible]

pregnant, ten months prior to the time of consultation. Since that time she had had the sensation that something was "loose in the back," and pain had developed in the legs.

Examination disclosed marked lordosis, with the torso sunken into the pelvis; forward bending was limited and painful. The sacrum was prominent, and its upper portion formed a shelflike projection. The cerebrospinal fluid was normal, and the neurologist could detect no neurologic signs of paralysis. Operation was performed according to the Meyerding technic. Two massive tibial grafts were placed in a trough of eroded bone formed by the spinous processes and lamina, extending from the third lumbar vertebra onto the sacrum, with the placing of multiple bone chips about the grafts and curetted facet articulations. About twenty years have elapsed since the operation and the time of this report. Six years after the operation the husband wrote, "My wife is well and happy," and the patient herself wrote, "I have had two children and am well pleased with the results of the operation" (Fig. 17).

ILLUSTRATIVE CASE 9 *(A thirty-year cure of spondylolisthesis, Grade 4, of the fifth lumbar vertebra by use of double tibial massive bone grafts).**—A woman aged 19 complained of backache, soreness and occasional numbness in the legs of four years' duration. There was no history of trauma. During menstruation and on walking up steps the pain was aggravated. No diagnosis had been made; the patient came a great distance for aid and advice because she wanted to be married but was disquieted because of her disability.

On examination a prominent shelflike sacrum, with a depression above it and a shortened torso telescoped into the pelvis were observed. There was tenderness about the lumbosacral and sacroiliac joints, with limitation of motion, especially on forward bending. Grade 4 spondylolisthesis was diagnosed, with forward and downward displacement of the fifth lumbar vertebra (Fig. 18, *a* and *b*). Operation was performed in October 1925. Fusion of the third, fourth and fifth lumbar vertebrae and the sacrum was performed, with the use of two massive tibial bone grafts. Many fragments of the tibia were packed about the eroded lamina and spinous processes. Convalescence was uneventful, and the patient was given a lumbosacral support and advised to avoid stress and strain to the back. Three and five years later roentgenograms were taken and showed firm fusion (Fig. 18, *c* and *d*). The patient was married and had children. This was the first case of spondylolisthesis in which I operated with the use of bone grafts, and it represents a thirty-year cure.

*This case was first reported in 1931.

SUMMARY AND CONCLUSIONS

The author describes his operation for obtaining firm, strong fusion of the spinal column by means of arthrodesis of the interarticular vertebral facets and the use of double massive tibial bone grafts and numerous chips and shavings of cortical bone and cancellous bone. He presents the histories of patients, drawings and photographs to illustrate factors of causation, the value of roentgenograms (especially lateral and oblique views), his classification of spondylolisthesis and the degrees of displacement of the involved vertebrae.

The majority of his patients were men engaged in heavy work, and more than half gave a history of trauma. Backache (90 per cent), with or without saddle pain or pain in the leg, was the common complaint. When unilateral or bilateral sciatica occurs, the possible presence of a protruded intervertebral disk must be excluded; if a protruded disk actually is present, a "combined operation" is indicated. Spondylolisthesis occurred at the fifth lumbar interspace most frequently (86 per cent); at the fourth (11 per cent) in his surgical cases. In the remaining 4 per cent of cases the lesion was above the level of the fourth lumbar vertebra, or constituted reversed spondylolisthesis. All patients with spondylolisthesis do not have symptoms, and the more severe backaches and disabilities do not always afflict those patients with the greatest degrees of displacement. About 10 per cent of diagnoses were made incidentally during examinations for other complaints. Many patients obtain relief by such conservative measures as the wearing of belts, braces or reinforced corsets or avoidance of

strain and change of occupation Surgical fusion of the third, fourth and fifth lumbar vertebrae is preferable because it prevents further deformity, forestalls increasing disability with pain, and restores the stability of the spinal column with a back strong enough to permit useful employment

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Der Verfasser beschreibt sein Verfahren zur Erzielung einer festen und starken Fusion der Wirbelsaule mittels Arthrodese der kleinen Zwischenwirbelgelenke und mit Verwendung doppelter massiver Knochentransplantate vom Schienbein und zahlreicher Stuckchen und Splitter von Knochenrinde und Spongiosa An Hand von Krankengeschichten, Zeichnungen und Photographien erortert er atiologische Faktoren, den Wert der Rontgenuntersuchung (besonders seitlicher und schrager Aufnahmen), seine Einteilung der Spondylolisthesis und den Grad der Verschiebung der befallenen Wirbel

Die Mehrzahl seiner Kranken bestand aus Schwerarbeitern, und mehr als die Halfte hatten in der Anamnese eine Verletzung aufzuweisen Die ublichen Beschwerden (90 Prozent) waren Ruckenschmerzen mit oder ohne sattelformige Ausstrahlung der Schmerzen oder Schmerzen im Bein Wenn eine ein oder doppelseitige Ischias besteht, muss die Moglichkeit eines Vorfalls einer Zwischenwirbelscheibe ausgeschlossen werden, liegt in der Tat ein Zwischenwirbelprolaps vor, so ist eine "Kombinationsoperation" angezeigt Die Spondylolisthesis tritt am haufigsten (86 Prozent) im funften Zwischenwirbelraum der Lendenwirbelsaule und in etwa 11 Prozent der chirurgischen Falle des Verfassers im vierten Zwischenwirbelraum auf In den ubrigen drei Prozent lag die Erkrankung oberhalb des vierten Lendenwirbels, oder es handelte sich um eine umgekehrte Spondylolisthesis Nicht alle Kranken mit Spondylolisthesis weisen Krankheitserscheinungen auf, und nicht immer leiden diejenigen unter den starksten Ruckenschmerzen und Behinderungen, die den hochsten Grad der Wirbelverschiebung aufweisen In etwa 10 Prozent der Falle, in denen eine Spondylolisthesis diagnostiziert wurde, geschah dies zufallig gelegentlich von Untersuchungen wegen anderer Beschwerden Vielen Kranken kann durch einfache konservative Massnahmen wie das Tragen von Gurteln, Schienen oder verstarkten Korsetts oder durch Vermeidung von Überanstrengung oder durch Berufswechsel geholfen werden Die chirurgische Fusion des dritten, vierten und funften Lendenwirbels ist anderen Verfahren vorzuziehen, weil auf diese Weise weitere Entstellungen und fortschreitende schmerzhafte Behinderung vermieden werden, eine Festigkeit der Wirbelsaule mit kraftigem Rucken erreicht wird und der Patient baldige Arbeits und Erwerbsfahigkeit erwarten kann

SUMARIO E CONCLUSOES

O autor descreve seu metodo para obter uma fusão firme, e forte da coluna espinhal por meio de artrodese das facetas vertebrais intearticulares e o uso de enxertos duplos de osso tibial massiço e numerosos fragmentos de osso cancelar e cortical Ele apresenta as histórias dos pacientes, desenhos e fotografias para ilustrar fatores de causa, o valor dos roentgenogramas, (especialmente vistas laterais e obliquas) sua classificação de espondilolistese e os graus de deslocamento das vertebras atingidas

A maioria de seus pacientes eram homens empregados em trabalho pesado, e mais da metade tinha uma história de trauma Dor nas c ~90%), com sem dor ou dor a quei comum Quando o ate ou bilateral, pode possivel de um disc

tuberado; quando um disco protuberado está realmente presente, uma "operação combinada" é indicada. A espondilolistese ocorreu no 5° interespaço lombar mais frequentemente (86%); no quarto (11%) em seus casos cirúrgicos. Nos 4% restantes a lesão estava acima do nível da 4ª vértebra lombar, ou constituia espondilolistese reversa. Todos os pacientes com espondilolistese não têm sintomas, e as mais severas dores nas costas e mal estar nem sempre afligem os pacientes com os maiores graus de deslocamento. Cêrca de 10% dos diagnósticos foram feitos incidentalmente durante o exame de outras queixas. Muitos pacientes obtêm alívio usando medidas conservadoras tais como cintos, ou corpetes reforçados ou evitando e mudança de ocupação. A fusão cirúrgica da 3ª, 4ª e 5ª vértebras lombares é preferível porque impede a deformidade posterior, evita a incapacidade crescente pela dor, e restaura a estabilidade da coluna espinhal com umas costas bastante fortes para permitir emprêgo útil.

RIASSUNTO E CONCLUSIONI

L'Autore descrive un suo metodo per ottenere una fusione solida della colonna vertebrale per mezzo dell'artrodesi delle faccette interarticolari e con l'uso di due grandi trapianti tibiali e di numerosi frammenti di osso corticale e spugnoso.

Egli, nel suo lavoro, presenta la storia dei pazienti, disegni e fotografie atte ad illustrare i fattori causali, radiogrammi (specialmente laterali ed obliqui), la sua classificazione di spondilolistesi e i gradi dis spostamento delle vertebre interessate.

La maggior parte dei suoi pazienti è costituita da uomini dediti a lavori pesanti e più della metà ha una storia di traumi.

Nel 90% si ha mal di schiena con o senza dolore a sella o dolore alle gambe. Se la sciatica è bilaterale è de escludersi un'ernia del disco: ma se è presente anche l'ernia del disco allora occorre un'operazione combinata. Per lo più la spondilolistesi si verifica al quinto interspazio lombare (86%); al quarto interspazio nell'-11%. Nei rimanenti 4 casi% la lesione era al di sopra del quarto interspazio. Non tutti i pazienti affetti da spondilolistesi hanno dolori e non sempre in quelli con i più alti gradi di spostamento si hanno mal di schiena o inabilità. Circa il 10% delle diagnosi venne fatta in occasione di esami per altre cause. Molti pazienti risentono di un certo sollievo indossando cinture o corsetti rinforzati, altri cambiando tipo di lavoro. La fusione chirurgica della terza, quarta e quinta vertebra è da preferirsi in quanto preserva da ulteriori deformità, arresta l'inabilità e il dolore e ripristina la stabilità della colonna vertebrale in modo da permettere utili impieghi.

RÉSUMÉ ET CONCLUSIONS

L'auteur décrit sa technique de spondylosyndesis ferme et solide au moyen de l'arthrodèse des facettes vertébrales interarticulaires et l'utilisation de doubles greffes massives de tibia et de nombreux éclats et fragments d'os cortical et spongieux. Il présente l'anamnèse de malades, avec des dessins et photographies illustrant les facteurs responsables, ainsi que des radiogrammes (surtout en position latérale et oblique), et sa classification du spondylolisthésis en indiquant les degrés de déplacement des vertèbres atteintes.

La majorité de ses malades sont des hommes occupés à de gros travaux; l'anamnèse indique un traumatisme dans plus de la moitié des cas; douleurs dorsales (90%), avec ou sans douleurs lombaires ou douleurs de la jambe. En cas de sciatique uni—ou bilatérale il faut exclure la possibilité d'un disque intervertébral; en cas de disque, une "opération combinée" est indiquée. La spondylolisthésis s'est présenté le plus souvent au niveau du 5e espace interlombaire (86%); au niveau

du 4e espace intervertébral (11%) dans les cas chirurgicaux de l'auteur Dans 4% des cas restants la lésion etait située au-dessus du niveau de la 4e vertebre lombaire, ou constituait un spondylolisthesis inverse Tous les patients atteints de spondylolisthésis ne presentent pas des symptômes, d'autre part les douleurs dorsales et les incapacités les plus graves n'atteignent pas toujours les malades presentant le degre de deplacement le plus elevé Environ 10% des cas ont éte diagnostiques incidemment au cours d'examens necessités par d'autres affections De nombreux malades sont soulagés par des methodes conservatrices telles que le port d'une ceinture, d'un corset renforce ou l'abstention d'efforts (changement de travail) Le spondylosyndesis chirurgical de la 3e, 4e et 5e vertèbre lombaire est *préférable car il évite une déformation* ulterieure, il prévient l'augmentation de l'incapacite accompagnée de douleurs, et restaure la stabilite de la colonne vertébrale avec un dos assez fort pour permettre un travail effectif

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There is only one way under high Heaven to get anybody to do anything—and that is by making the other person want to do it

—Carnegie

A man's felicity consists not in the outward and visible blessings of fortune, but in the inward and unseen perfections and riches of the mind

—Anacharsis

Displacement of the Cervical Portion of the Spine

Identification and Assessment

IRVIN DEUTSCH, M.D., D.A.B.

MIAMI BEACH, FLORIDA

SINCE Kilian in 1853 coined the term "spondylolisthesis," many classifications of malalignment of the vertebrae have been worked out, particularly with reference to the lumbar and lumbosacral regions, e.g., Meyerding's, Garland's and Meschans' lines and grades.

Owing to the frequency of injuries of all types to the neck, it seems advisable to set up a rapid and simple method of identifying and assessing similar displacements in the cervical portion of the spine. This examination is not an attempt to supplant investigation for evidences of fracture, infection, degeneration, necrosis, anomaly or neoplasm, and it must be kept in mind that *any cause of limitation of motion* of the cervical portion of the spine (regardless of cause) *will alter the reference points* to be described.

The method to be outlined is of considerable help in assessing disc injuries and subluxations and utilizes lateral roentgenograms of the cervical portion of the spine in various positions. It is conducted as follows:

Three lateral roentgenograms are taken of the neck with the patient erect and at the greatest target-film distance that can be secured with the equipment available. These three studies are designated "neutral," "forward flexion" and "backward flexion" (extension). The patient executes the last two movements to the limit of his ability. (He is not to be aided.) The axes of flexion are arranged as follows:

1. A line is drawn parallel to the posterior border of the seventh cervical vertebra, and another is drawn in the same manner to the posterior border of the second cervical. In the "neutral" position the point of intersection is at the fifth cervical level, or the fourth to fifth; in "forward flexion" it is the fourth to fifth cervical level, and in "backward flexion" (extension) it is the fifth cervical.

This schema utilizes only three roentgenograms that require very simple technic. As a screening maneuver, it may be all that is needed in cases of early recent injury. Obviously it does not replace careful and complete physical and roentgen examinations.*

2. To utilize the schema described, one proceeds as follows: If the points of intersection (reference points) are at variance with the points mentioned, pathologic change is present and a full study should be done. Roentgen analysis of the study must include and note at least the following items:

1. Deviation of the cervical portion of the spine from the midline.

2. Alteration of the usual lordotic curvature.

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*In my own office the basic procedure for study of the cervical portion of the spine includes the following views: (a) lateral-neutral, (b) lateral-extension and (c) lateral flexion, in each instance right side and left side down; (d) anterior oblique, right and left sides; (e) anteroposterior, with the patient's mouth open, and (f) anteroposterior, lower portion of the cervical segment of the spine, angled 5 degrees toward the head. This is not less than 10 studies, and even more may be needed at times.

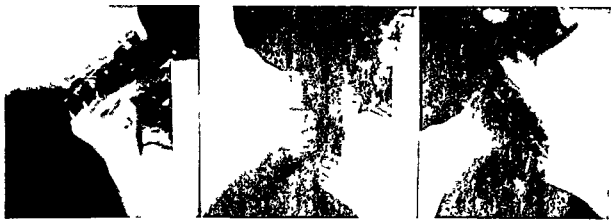

Fig. 1 —Normal roentgenograms, at rest and with excursion

3. Status of the intervertebral foramens, both right and left.

4. Status of the uncovertebral joints, both right and left.

5. Status of the apophyseal joints, both right and left.

6 Status of disc spaces and intercartilaginous joints.

7. Presence or absence of mineralizations as well as fractures, etc.

After injuries to bones and joints, the roentgenograms may show no departure from the normal for weeks or months if vascularity has been impaired, although clinical signs and symptoms may be present. During this roentgenographically latent period much damage may be done by injudicious exercise and use of the part. *Avascularity can be recognized when sufficient time has elapsed to permit decalcification of the adjacent normal bone.*

I have been using this method since 1941 and have found it of considerable help. It is simple and trustworthy.

Fig 2 —Abnormal roentgenograms, at rest and with excursion.

SUMMARY

The author describes a method for determining the presence of displacement of the cervical portion of the spine. Three roentgenograms are taken and points of reference established therefrom. If these vary from the usual "normal" points, the alteration is due to some pathologic cause. A full study should then be made. The author has employed this method since 1941 and has found it simple, trustworthy and definitely helpful.

RIASSUNTO

L'Autore descrive un metodo per determinare se vi sia spostamento della porzione cervicale della colonna vertebrale. Esso consiste nel prendere tre radiogrammi e nel controllare i punti di repere. Se tali punti di repere variano da quelli "usuali," l'alterazione è dovuta a cause patologiche che conviene studiare attentamente. L'Autore usa questo metodo fin dal 1941 e lo trova semplice, attendibile e utilissimo.

SUMARIO

O autor descreve um método para determinar a presençã de deslocamento da porção cervical da espinha. Três chapas são tiradas e pontos de referência são alí estabelecidos. Se êles variam dos pontos "normais" usuais, a alteração é devida a alguma causa patológica. Um estudo completo deve então ser feito. O autor vem empregando êste método desde 1941 e achou-o simples, de confiança e definidamente satisfatórios.

ZUSAMMENFASSUNG

Der Verfasser beschreibt ein Verfahren zum Nachweis von Verschiebungen der Wirbel im Halsabschnitt. Er macht drei Röntgenaufnahmen, an denen Punkte und Linien der Orientierung vermerkt werden. Weichen diese vom "Normalbefund" ab, so liegen pathologische Verschiebungen vor, und eine umfangreichere Untersuchung ist angezeigt. Der Verfasser hat sich dieses Verfahrens seit 1941 bedient und findet es einfach, zuverlässig und wertvoll.

RÉSUMÉ

L'auteur décrit une méthode en vue de déceler la présence d'un déplacement de la partie cervicale de l'épine dorsale. Trois radiogrammes sont faits et des points de repère établis. Si ceux-ci varient et s'écartent des points "normaux" une modification pathologique est en cause. Une étude complète du cas est alors indispensable. L'auteur utilise cette méthode depuis 1941; elle est simple, sûre et précieuse.

If we consider the frequent reliefs we receive from laughter. and how often it breaks the gloom which is apt to depress the mind. one would take care not to grow too wise for so great a pleasure of life.

—*Addison*

Treatment of Neurologic Conditions Affecting the Eye, Ear, Nose and Throat

C S LINTON, M D F I C S, D A B

KENNETT MISSOURI

OBSERVATIONS during the past few years have revealed the fact that the ear, the nose, the throat and especially the eyes are sensitive barometers indicating the general physical condition Poor health existing as a result of disturbed nutrition was found to be the basic underlying factor in most unsatisfactory results from the fitting of glasses or the treatment of pathologic conditions of the ear, nose and throat The nutritional defect may be caused by improper eating or may be secondary to any of numerous factors — digestive disturbances and debilitating diseases that result in disturbed digestion and metabolism

Neurologic Symptoms — I propose in this article to outline a group of mental, nervous and physical symptoms often associated with disturbances of the ear, nose and throat, which in my hands have responded, many times miraculously, to nutritional treatment The same symptoms are not present in every patient but may occur in different combinations, always with a background of some kind of nervous derangement Scattered neuritic pains are usually present The eye, ear, nose and throat specialist is frequently consulted for a severe pain about the ear, the jaw, the back of the head or the eyes, or the case is referred to him by a dentist who can find nothing wrong with an aching tooth Some patients recite a history of "sinus trouble" of long or short duration, although the sinuses are perfectly clear There may be ulcerative stomatitis, a raw sore throat, tinnitus that prevents sleeping, vertigo or perceptive loss of hearing A localized burning sensation in the mouth or throat occurs frequently The level of vision is variable from moment to moment and day to day with the same correction, and the refractionist finds it impossible to make the patient comfortable with glasses The eyes are often inflamed and sticky with secretions, and corneal ulceration is sometimes present In cases of severe involvement, vision may fade away altogether for minutes, hours or days

Associated general symptoms are a choking sensation, the feeling of a lump in the throat, worry, depression or irritability Aching, cramping or numbness of the extremities is observed in many cases Insomnia is often present, and there may be a history of "nervous breakdown" Even trigeminal neuralgia seems to be related to this deficiency syndrome Intermittent tachycardia is observed frequently, as are anorexia and constipation The internist is concerned with the frequent occurrence of thoracic pain, which may be precordial or angina-like, and the surgeon is concerned with scattered pains in the abdomen General weakness and chronic fatigue that is not relieved by sleep is a common complaint.

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All of these symptoms responded completely or in large measure to the treatment given. Since the treatment is nutritional, the entire group may be placed in a single package and labeled "deficiency syndrome." No attempt will be made to explain how and why improvement is secured. Suffice it to say that all tissues seem to function in a manner more nearly approaching the normal.

General Considerations.—The important role of nutrition in health and disease is well known and has been thoroughly established. It is my opinion that many more persons enter the doctor's office suffering from nutritional disturbances than is generally recognized. The modern manner of living has much to do with the development of dietary deficiencies in all economic strata of society.

Most Americans put in much shorter hours earning a living than did their ancestors and much longer hours trying to make life enjoyable and worth while. They are clubbed, wined, dined and partied until they scarcely have time to eat or sleep. Even school children get into the habit of rushing through a meal in order to be somewhere else. Eating is accepted as the least important function of the day, instead of the most important.

Frequently the eyes reflect a weakening general physical condition before the patient is aware of any change. Refractions performed at intervals may show slight or significant lens changes, but making changes in the lenses does not improve the comfort of patients with glasses. Many have reduced vision even with the best correction, or the vision may be variable. Some are relieved by removal of chronically infected teeth or tonsils, and others return to normal after recovery from a chronic illness, such as tuberculosis. These observations strongly indicate that the ocular trouble is primarily systemic. No matter how much one tries to specialize, it is impossible to separate the head from the body; it is dependent upon the system just as field crops are dependent upon the soil.

Many patients without obvious foci of infection were given relief from eye strain and made comfortable with glasses by a course of two to four weeks on vitamin concentrates administered by mouth. Vision that was apparently defective often returned to normal after this treatment without any change of lenses. Patients given such therapy to improve visual stability frequently reported marked improvement or relief of other symptoms.

The only common denominator in all these conditions is the nervous system. It was concluded, therefore, that results were being secured largely through improvement in neural function. This conclusion was supported by the fact that the treatment was heavy in Vitamin B concentrates, which are known to be necessary in the proper functioning of nerve tissue. Results secured with oral preparations alone were slow and irregular, which was not surprising considering the chronicity of some of the cases. Many of the patients complained of "nervous stomach," peptic ulcers, chronic constipation, allergy to foods and other conditions that affect the digestion and assimilation of food. It was decided, therefore, to try intravenous vitamins along with the oral, in order to make sure that the therapy was actually reaching the tissues.

Treatment.—The exact treatment varied somewhat as time went on, but all patients were given a printed sheet indicating the better sources of Vitamins A, B and C, together with dietary advice on the treatment of constipation. It also stated that some lean meat should be eaten every day. One of the strongest B complex concentrates was selected, called "Combex Therapeutic,"* the name of which was later

*Parke-Davis Co.

changed to Theracombex with the addition of folic acid. This was supplemented by Vitamin B_1, 25 mg. twice daily.

Theracombex was given after breakfast and thiamine morning and evening. Some patients with marked constipation or sallow complexion were given 5 tablets of brewers' yeast two or three times daily.

The composition of Theracombex is as follows:

Thiamine	25 mg.
Riboflavin	15 mg.
Pyridoxine	1 mg.
Niacinamide	100 mg.
B_{12}	10 mg.
Ascorbic acid	150 mg.
Folic acid	2.5 mg.

Intravenous therapy has been used at intervals for five to six years. Significant ill effects have never been observed from any of the injections. They consist of Vitamin C, 500 mg.; thiamine hydrochloride, 100 mg., and a B complex containing the following substances in each milliliter: Vitamin B_1, 100 mg.; riboflavin, 2 mg.; pyridoxine, 4 mg.; niacinamide, 100 mg., and calcium pantothenate, 10 mg. Injections were given twice a week. One ml. of the B complex and 1 ml. of Vitamin B_1 containing 100 mg. per milliliter were mixed in a 10 ml. syringe with 500 mg. of Vitamin C dissolved in 5 ml. of sterile water. The injection was given slowly in an arm vein with a 26-gauge needle.

Vitamin B_{12}, usually in quantities of 500 micrograms, was given in the muscle at the same time. This was added after a report came out indicating the value of massive doses of Vitamin B_{12} for various types of neuritis. A few doses were given in amounts varying from 300 to 1000 mcg., with no observable difference in response. The minimum effective dose is yet to be determined. It is known that such large doses are not necessary for treatment of anemia, and I suspect that they may not be necessary in the treatment of neuritis. In my single case of trigeminal neuralgia the disease was kept under control quite well by the use of B complex factors alone, containing only minor quantities of B_{12}.

A good history is essential in these cases. If noticeable response is not secured after a few injections, or if response is too slow, there should be a recheck for possible foci of infection, food allergies or other conditions that interfere with nutrition and produce localized symptoms. The patient may fail to heed dietary advice or continue a daily laxative routine without making any effort to stop. Synthetic preparations should be substituted when allergies or other causes interfere with securing adequate amounts of Vitamins A and C in the diet. There must also be adequate intake of protein. The chain of nutrition is no stronger than its weakest link.

Results.—Seventy cases (see table) are reported in this series, with good or excellent results in 64, or 91 per cent. All of the patients were given oral therapy and intravenous vitamin therapy as well as dietary advice.

It is obviously difficult to make an accurate and scientific evaluation of results in patients having such a large number and variety of complaints. The subjective impression of the patient and, in many cases, a change in appearance, mental attitude and behavior have been used as the principal means of evaluation. The results were considered excellent or good when there was complete or almost complete relief of the principal complaints and were designated "poor" or "a failure" when there was little or no relief.

Statistics do not tell the entire story. Some patients secured dramatic relief from nervous tension, pain or mental agitation from one or two injections. Occasionally great relief would be felt within a few minutes. A woman 81 years old, with marked palsy of the hands, stopped shaking after a few injections, and her family as well as [illegible]ght

Relative Frequency of Symptoms in 70 Neurologic Cases

Symptoms	Total Cases		Chief Complaint	
	No.	%	No.	%
1. General nervousness	59	84	30	43
2. Numbness, aching, cramping of extremities	47	67	21	30
3. Neuritis	45	64	21	30
4. Defective hearing, tinnitus, vertigo	33	47	15	21
5. Insomnia	33	47	4	6
6. Worry, depression, agitation	33	47	17	24
7. Intermittent tachycardia	30	43	2	3
8. Variable vision, asthenopia	32	46	13	19
9. Choking or lump in throat	27	39	16	23
10. Chronic constipation	26	37	14	20
11. Anorexia	22	21	5	7
12. Chest pain	19	27	6	9
13. Blepharitis	14	20	3	4
14. Stomatitis, sore mouth	13	19	2	4
15. Abdominal pain	11	16	3	4
16. Nervous breakdown	11	16	2	3

she looked ten years younger. She no longer required a helping hand to get around. A 75-year-old woman convalescing from a major operation was writhing with mental agitation and pain. Within five minutes she became calm and said that a weight had been lifted from her chest and the pain was about gone from her legs. A lawyer with thoracic pain relieved by nitroglycerine was soon able to resume his normal activities without nitroglycerine. One woman returned for more injections because her husband had said she was easier to get along with! Another had been badly frightened when her husband drove the car 55 or 60 miles an hour, but thought nothing of it after a few injections.

Chronic fatigue is a symptom of major importance that was not at first considered. It occurred in not less than 15 of these cases, and in practically all it was relieved and the patients enabled to continue work they had previously been unable to do.

An observation of great importance is the relation of perceptive hearing loss, tinnitus and vertigo to this nutritional neurologic syndrome. Symptoms referable to the eighth nerve rank fourth in frequency in these cases. They were present in 33 and a chief complaint in 15.

The treatment seems to exert a general stimulating effect on the digestive tract. The appetite usually improved, but at the same time some patients were able to lose weight. The man who stated that his stomach was "too small" soon found he could eat more, and the woman who had taken a laxative practically every day for forty years found that she could get along without it.

Variable vision or ocular pain is especially important and is one of the more common observations in persons with unstable health. Ocular symptoms not correctable by refraction were present in at least 32 of the 70 cases. Numb, aching or cramping extremities were present in 67 per cent and were almost invariably relieved. This was a chief complaint of 13 per cent.

The relief of symptoms commonly diag-

nosed as due to globus hystericus was usually prompt and gratifying Only 1 failure in 27 cases is reported

Insomnia is a common symptom in nervous patients and is usually relieved, together with the other neurologic manifestations

In 6 cases the results of treatment were classed as unsatisfactory, although in at least 3 of these, from the patients' point of view, they were not completely unsatisfactory One, a woman 73 years old, was extremely senile and had high blood pressure She was given four series of injections over a two-year period, to a total of 21 injections She felt better after the first three series, but the final result after treatment was stopped was "no noticeable improvement" Another, a 70-year-old woman, complained of a glossopharyngeal neuralgia, deafness and tinnitus A series of 6 injections in March 1955 produced much improvement The patient failed to follow oral therapy, and in January 1956 a series of 8 injections failed to relieve the pain in her tongue An intracranial operation was performed The third patient was a 44-year-old woman who complained of extreme nervousness, tinnitus and some deafness She was given 11 injections over a period of forty-two days There seemed to be improvement at times, and then she would relapse The cause of this failure is unknown, but it is considered likely that she had an undiscovered allergy Two trips to Barnes Hospital in St Louis failed to reveal the cause of the trouble

Some patients with symptoms of general nervousness stated that they had undergone prolonged treatment with estrogenic substances for the menopausal syndrome All were relieved by the nutritional treatment and were able to discontinue hormone therapy One 49-year-old woman had been given theelin injections regularly for nine years No attempt is made to explain these results, which are recorded as interesting and unexpected

One of the 3 remaining patients was given only 3 injections and complained, among other things, of a "nervous stomach," which was probably due to food allergy She was not seen again after certain foods had been eliminated In the remaining 2 cases the patients were probably not adapted to this kind of treatment One was a man aged 65, with general weakness, arthritis of the spine and obvious senility His general strength and alertness improved to some extent, but the overall picture changed little with 7 injections The other patient was a woman aged 32, with nervousness of four to five days' duration and diplopia associated with the estrogenic cycle She was given only 3 injections in about one week, which is inadequate for either treatment or observations

REPORT OF CASES

CASE 1 *(Trigeminal Neuralgia)*—Mrs A A O, aged 69, complained of severe shooting pains in the right side of the face with a trigger point in the upper lip starting in the fall of 1951 In addition she mentioned general nervousness, insomnia marked fatigue and inability to eat because of pain She was in a depressed mood and unable to do her work She was first seen four months after the beginning of symptoms and was given the usual intravenous and oral therapy, but no Vitamin B_{12} There was almost complete recovery after 2 injections The symptoms recurred after some weeks, and she went to St Louis, where a posterior root section of the fifth nerve was advised She returned for more nutritional treatment instead There were four relapses in the next five years, and each time she was effectively relieved Laxity in oral therapy preceded most of the return visits A nervous shock from a motor accident apparently precipitated one attack A burning pain in the lateral aspect of the leg always preceded facial pain Recovery from pain was accompanied by improved strength and a general feeling of well being

CASE 2 *(Vertigo)*—Mrs T E M, a woman 35 years old, w Feb 29, 1956 complaining of tion at af

enough to prevent walking. Other symptoms were a choking sensation, a thick feeling in the tongue and numbness of the extremities. The patient was a heavy smoker. The oral and intravenous treatment was given, and she was advised to stop smoking. Dizziness was almost gone after the first injection. After twenty-two days and 6 injections she said that she had never felt better. Her complexion had improved, and there was less fatigue. It was discovered that she had been smoking a few cigarettes each day.

CASE 3. (*Globus Hystericus*).—Mrs. Z. B., a woman aged 36, consulted me primarily because of a choking sensation and a lump in the throat that could not be dislodged. There was also some ocular pain, aching and numbness of the extremities, pain in the right occipital area, left intercostal pain, anorexia, heartburn and regurgitation, constipation and extreme nervousness. Previous studies had shown slightly low blood pressure with the electrocardiogram, the basal metabolic rate and thoracic roentgenograms all within normal limits. She was given routine therapy plus 5 brewers' yeast tablets three times a day. Three days later she reported that she felt like a different person. Symptoms persisted, however, with gradual improvement. Further questioning revealed heavy smoking and coffee drinking, which were stopped. The nerves and general strength were much improved after eighteen days, but constipation and pain in the left intercostal and colonic areas continued. It was discovered that onions would cause thoracic pain and orange, grapefruit, tomato and lettuce resulted in digestive symptoms. Elimination of these resulted in rapid clearing of all symptoms.

The patient was given 16 injections over a period of fifty-three days. When she was last seen there had been no symptoms for some time, and she had been working hard with no ill effects. Here was a definite case of globus hystericus that cleared rapidly under nutritional therapy. The nutrition was complicated by food allergies, and some symptoms persisted until this cause was eliminated.

CASE 4 (*Neurologic Symptoms of the Ear, Nose and Throat*).—Mrs. W. S. C. complained chiefly of a burning throat, throbbing in the throat, intermittent pain in the ears, headache, frequent nasal blockage and postnasal drip. The general symptoms were chronic fatigue, palpitation, leg ache, extreme nervousness and irritability and a noticeable lag in ability to remember. The patient was apprehensive about becoming unable to do her work. Routine treatment was started, and after 3 injections there was a remarkable improvement in strength and nervous stability, as well as in local symptoms. Her husband said that she seemed like a different person. All symptoms were gone after 6 treatments. Four more injections were given at intervals over the next two months and another series after an attack of influenza six months later. Each time there was improvement. The recovery from mental symptoms as well as from those referable to the ear, nose and throat, was particularly interesting in this case.

CASE 5 (*Stomatitis*).—Mrs. W. W., a woman 70 years old, complained of a sore mouth, the soreness being of nineteen months' duration. The tongue was beefy red and ulcerated and had a white leukoplakia-like coating. Other symptoms were aching and numbness of the extremities, insomnia, a tendency to worry, and pain in the shoulders, elbows and knees of four years' duration. Eating was painful. Routine therapy included 5 brewers' yeast tablets three times daily. All ulcers were healed after 3 injections. Sensitivity to citrus fruits and tomatoes was discovered. These were eliminated, and the patient was given ascorbic acid, 100 mg., three times daily. She was given 10 injections over a thirty-day period, after which time all symptoms were much improved. The white coating on the tongue, however, did not completely disappear. Six weeks after injections were stopped the patient was doing well, but the tongue was still thick and raspy.

CASE 6 (*Raw Sore Throat and Neuritis*).—Mr. O. P., a 29-year-old mechanic, complained of a mildly irritating sore throat persisting constantly for one month. There had been frequent attacks during the past year. Penicillin administered elsewhere had not given relief. The tonsils had been removed, and examination of the throat showed only slight redness.

The history revealed severe general nervousness, accompanied by irritability, depression and worry. A small burn on the hand had almost caused the patient to quit his job. Shooting pains were frequently present in the back of the neck, behind the ears and in the legs. The patient complained of much numbness and aching of the legs and also of chronic constipation. The soreness in the throat extended to the gums and palate. Other complaints were intermittent tachycardia, irregular appetite, visual instability, some redness of the lid margins, occasional tinnitus and vertigo and, formerly, much pain in the chest.

The regular oral and intravenous therapy was given Soreness in the throat disappeared and the patient felt much better after the first injection After the second he noted increased energy and improvement of the appetite He continued to improve in every way, acquiring a sense of improved mental as well as physical well being

CASE 7 *(Asthenopia and Photophobia)* — Mrs F M G, aged 40, consulted me for pain in the eyes and photophobia, which had been present most of her life She could not be helped by lenses Other symptoms were general weakness extreme nervousness, anorexia loss of weight, tingling and numbness of the extremities and shortness of breath The history indicated a "nervous breakdown' in 1950 followed by temporary loss of hearing and persistent anosmia She had been given injections of theelin regularly for nine years All symptoms cleared rapidly under oral and injection therapy The asthenopia improved but was not completely eliminated after 16 injections over a sixty day period It was discovered that the patient had been taking mineral oil regularly Theelin was not required after this treatment was started, and the patient's strength and feeling of well being returned to normal

SUMMARY

The establishment of good nutrition is obviously not a symptomatic type of treatment It must be continuous to be most effective, and there is evidence to indicate that, when the various essential elements are continuously available to the tissues, the concentration in which they are supplied may be greatly reduced The effective concentration may vary with the individual patient and the diseased state

In an attempt to meet all requirements, the doses given were high It is clearly desirable to treat all patients with a regimen of oral preparations and food sources of essential nutrients as soon as possible A marked tendency exists, as soon as the patient feels better, to lapse into the old methods of eating and living that produced the trouble in the first place

The nutritional treatment outlined rests purely on an empiric basis It has been used for a wide variety of neuropsychiatric patients with symptoms touching practically every field of medicine The excellent results secured in treatment of difficult-to-cure symptoms in the "head specialties" (neuritis, asthenopia, tinnitus, globus hystericus, vertigo and stomatitis) were accompanied by equally remarkable improvement in systemic symptoms

Some of the systemic conditions that yielded to treatment were numbness, aching or cramping of the extremities, pains in the chest, the abdomen, the back and elsewhere, chronic constipation, insomnia, anorexia, chronic fatigue, general weakness, general nervousness, and a wide variety of nervous and mental symptoms ranging from temporary loss of memory, worry, depression and irritability to suicidal tendencies and a subjective sensation of mental derangement

In the author's opinion the method outlined will be of great value in surgical diagnosis, since it helps to eliminate pain of neural origin, which might otherwise require an exploratory operation It may also improve the operative risk from some debilitated patients Hope is extended to a vast army of patients with nervous and mental diseases that their trouble may be prevented or alleviated The relief of fatigue, worry, irritability, insomnia, etc may have far-reaching effects on industry, the home and society The relief of unreasonable fears while riding in a car suggests the possibility of a remedy for backseat driving The elimination of chronic fatigue by the correction of nutritional defects may prevent many motor accidents, as well as accidents in the home and factory Finally, the way may be opened to an important method of improving family harmony and reducing juvenile delinquency

RIASSUNTO

Una buona [illegible]ion e
tipo di trat[illegible]

essere continua perchè sia più efficace ed è chiaro che se i vari elementi essenziali sono continuamente a disposizione dei tessuti, la concentrazione può esserne grandemente ridotta.

La concentrazione può inoltre variare a seconda dell'individuo e a seconda dello stato di malattia.

Allo scopo di soddisfare tutti i fabbisogni vennero somministrate delle forti dosi. E' desiderabile che tutti i pazienti possano venir trattati con preparati per uso orale e con i costituenti essenziali dell'alimentazione.

Esiste la cattiva abitudine di consentite, non appena il malato si sente meglio, che egli riprenda a comportarsi e a nutrirsi come prima di ammalare.

Lo schema di alimentazione suggerito è stato formulato su basi empiriche e adottato in un gran numero di malati nervosi con disturbi svariatissimi. Gli ecellenti risultati ottenuti nella cura di sintomi ribelli nelle malattie nervose (neuriti, astenopia, globe isterico, vertigini, stomatiti) si ottennero del pari anche nel confronto degli altri disturbi di carattere generale.

Questi ultimi erano rappresentati da senso di peso o crampi delle estremità, dolori al torace, all'addome, alla schiena o altrove, stipsi cronica, insonnia, anoressia, fatica, debolezza, nervoso, oltre a disturbi nervosi e mentali quali la perdita della memoria, la preoccupazione, la depressione nervosa, l'irritabilità, la tendenza al suicidio e la sensazione soggettiva di non avere la testa a posto.

L'Autore è d'avviso che il metodo proposto possa essere utile nelle diagnosi chirurgiche dacchè consente di eliminare i dolori di origine nervosa che altrimenti richiederebbero un intervento esplorativo. Consente a una gran quantità di malati nervosi e mentali la speranza di migliorare i loro disturbi. Si otterranno effetti inestimabili dal punto di vista unamo e sociale togliendo a questi malati il senso della fatica, della irritazione, della insonnia. La scomparsa della fatica, correggendo i difetti della nutrizione, può prevenire molti incidenti automobilistici o sul lavoro. Infine può influire sui rapporti familiari e ridurre la delinquenza minorile.

SUMARIO

O estabelecimento de bôa nutrição não é, óbvio, um tipo sintomático de tratamento. Deve ser contínuo para ser bem eficaz, e há evidência para indicar que, quando os vários elementos essenciais se acham contìnuamente viáveis para os tecidos, a concentração na qual são supridos pode ser grandemente reduzida. A concentração eficaz pode variar com cada paciente e o estado da moléstia.

Em uma tentativa para suprir tôdas as exigências, as doses dadas foram altas. É claramente desejável tratar todos os pacientes com um regimen de preparações orais e e comida de nutrientes essenciais, o mais breve possível.

O tratamento nutricional descrito depende puramente da bases empíricas. Foi usado para uma grande variedade de pacientes neuropsiquiátricos com sintomas que compreendiam pràticamente todos os campos da medicina. Os resultados excelentes asseguardos no tratamento de sintomas difíceis de se tratar em "especialidades da cabeça" (neurite, astenopia, tinnitus, globus hystericus, vertigo e estomatite) foram acompanhados de melhora igualmente notável dos sintomas sistêmicos.

Alguns dos sintomas sistêmicos que responderam ao tratamento foram mudez, dor ou caimbra das extremidades; dores no tórax, abdomen, costas e outros lugares; constipação crônica; insônia; anorexia; fadiga crônica; fraque sa geral; nervoso geral; e uma grande variedade de sintomas nervosos e mentais variando da perda temporâria de memória, preocupação, de-

pressão e irritabilidade a tendências suicidas e uma sensação subjetiva de desarranjo mental.

Na opinião do autor, o método descrito será de grande valor no diagnóstico cirúrgico, uma vez que ajuda a eliminar a dor de origem neural, que de outra forma poderia exigir uma operação exploratória. Pode também melhorar o risco operatório para alguns pacientes debilitados. A esperança se estende para um grande exército de pacientes com moléstias nervosas e mentais de que seus incômodos serão prevenidos ou aliviados. O alívio da fadiga, preocupação, irritabilidade, insônia, etc., pode ter efeitos de longo alcance na indústria, no lar e na sociedade. O alívio de temores irrazoáveis ao se andar de automóvel sugere a possibilidade de um remédio para se guiar no banco de trás. A eliminação de fadiga crônica pela correção de defeitos nutricionais pode impedir muitos acidentes de carro, bem como acidentes no lar e na fábrica. Finalmente, o caminho pode ser aberto para um importante método de melhorar a harmonia da vida de família e reduzir a deliquência juvenil.

ZUSAMMENFASSUNG

Die Versorgung mit guter Ernährung ist offentsichtlich nicht eine nur symptomatische Form der Behandlung. Gute Ernährung ist von grösster Wirksamkeit, wenn ihr Durchführung fortgesetzt wird. Es liegen deutliche Beweise vor, dass die Konzentration der Zufuhr der verschiedenen elementaren Nährstoffe erheblich herabgesetzt werden kann, wenn den Geweben diese Stoffe ständig zur Verfügung stehen. Die wirksame Konzentration ist bei den einzelnen Patienten und je nach dem Zustand der Erkrankung verschieden.

Mit der Absicht allen Anforderungen zu genügen verabreichte der Verfasser hohe Dosen. Es ist offensichtlich erstrebenswert, allen Patienten so bald wie möglich eine Diät von einnehmbaren Präparaten und Nahrungsmitteln, die die wesentlichen Nährstoffe enthalten, zuzuführen. Es besteht eine starke Neigung, in die alten Ernährungs-und Lebensgewohnheiten, die ursprünglich zur Erkrankung geführt hatten, zurückzufallen, sowie der Patient sich besser fühlt.

Die vom Verfasser angegebene Ernährungsbehandlung beruht auf rein empirischer Basis. Sie ist an neuropsychiatrischen Kranken verschiedenster Art angewandt worden, deren Beschwerden praktisch in alle Gebiete der Medizin hineinreichten. Die ausgezeichneten Erfolge, die in der Behandlung schwer zu heilender Erscheinungen von "Kopfkrankheiten" (Neuritis, Schwachsichtigkeit, Ohrenklingen, Globus hystericus, Schwindel und Mundhöhlenentzündung) erzielt wurden, gingen mit einer ebenso bemerkenswerten Besserung der Allgemeinerscheinungen einher.

Zu den auf die Behandlung ansprechenden Allgemeinsymptomen gehörten Taubheitsgefühl, Schmerzen oder Krämpfe in den Gliedmassen, Schmerzen in der Brust, im Bauch, im Rücken oder anderen Körperteilen, chronische Verstopfung, Schlaflosigkeit, Appetitlosigkeit, chronische Müdigkeit, allgemeine Schwäche und Nervosität und eine grosse Anzahl verschiedener nervöser und seelischer Beschwerden wie zeitweiliger Gedächtnisverlust, Angstzustände, Depressionen und Reizzustände bis zu Selbstmordneigungen und subjektivem Gefühl der Geistesgestörtheit.

Der Verfasser hält das von ihm beschriebene Behandlungsverfahren für recht wertvoll in der chirurgischen Diagnostik, weil es dazu verhilft, Schmerzen nervösen Ursprungs auszuschalten, die unter Umständen zu einer explorierenden Operation Anlass geben könnten. Ferner kann die Behandlung das Risiko einer Operation bei geschwächten Patienten herabsetzen. Er hofft, einer grossen Menge von Kranken mit nervösen und seelischen Leiden Hilfe versprechen zu [illegible]

Befreiung von Müdigkeit, Angstzuständen, Reizbarkeit, Schlaflosigkeit usw. kann auf dem Arbeitsplatz, in der Häuslichkeit und in der Gesellschaft zu weit reichenden Wirkungen führen. Die Beseitigung unbegründeter Ängstlichkeit beim Autofahren eröffnet die Möglichkeit, die störende Nervosität von Mitfahrern aus dem Wege zu schaffen. Die Heilung chronischer Müdigkeit durch Ausgleichung von Nährschädigungen kann zur Verhütung vieler Automobilunfälle und anderer Unfälle im Hause oder an der Arbeitsstätte beitragen. Schliesslich mag hier auch ein wichtiges Verfahren zur Verbesserung der Familienbeziehungen und zur Herabsetzung der Kriminalität der Jugendlichen gegeben sein.

RÉSUMÉ

L'administration d'un régime alimentaire bien étudié doit être continue pour être efficace, et il est clair que lorsque les divers éléments nutritifs essentiels sont apportés aux tissus avec rogularité, leur concentration peut être grandement réduite; celle-ci peut varier selon les malades et leur état.

En vue de satisfaire à tous les besoins de l'organisme, les doses ont été élevées dans les cas traités par l'auteur. Il est hautement souhaitable d'administrer les éléments nutritifs essentiels le plus tôt possible. Il existe une tendance marquée, dès que le malade se sent mieux, à retomber dans les anciennes habitudes d'alimentation et de vie ayant été une des causes principales de la maladie.

La thérapeutique alimentaire décrite repose purement sur des bases empiriques. Elle a été utilisée dans un grand nombre de cas de neuropsychiatrie avec symptômes touchant pratiquement tous les domaines de la médecine. Les excellents résultats obtenus dans le traitement de certains symptômes rebelles des "affections de la tête" (névrite, asthénopie, bourdonnements d'oreilles, boule hystérique, vertige et stomatite) ont été accompagnés d'une amélioration également remarquable des symptômes généraux.

Quelques-uns des symptômes généraux rebelles consistaient en torpeur, douleurs ou crampes des extrémités, douleurs thoraciques, abdominales, dorsales ou autres, constipation chronique, insomnie, anorexie, fatigabilité chronique, faiblesse générale, nervosité, ainsi qu'un grand nombre de symptômes nerveux et mentaux allant de la perte de mémoire temporaire à l'anxiété et à l'irritabilité, jusqu'à la tendance au suicide et à l'impression subjective d'un trouble mental.

L'auteur pense que la méthode décrite peut avoir une valeur aussi dans le diagnostic chirurgical, car elle aide à éliminer les algies d'origine neurale qui pourraient autrement exiger une opération exploratrice. Elle peut également diminuer le risque opératoire chez certains malades affaiblis. Elle permet en outre de donner à un nombre considérable de malades souffrant d'affections nerveuses et mentales l'espoir que leurs troubles pourraient être évités ou atténués. Le soulagement de l'état de fatigue, d'anxiété, d'irritabilité, d'insomnie, etc, peut avoir des effets à distance sur l'industrie, la famille et la vie sociale. De plus l'élimination de la fatigabilité chronique par la correction du régime alimentaire peut aider à éviter bien des accidents dans tous les domaines. Enfin, la voie peut par là être ouverte à une importante méthode d'amélioration de l'harmonie familiale, et à la réduction de la délinquence juvénile.

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Rehabilitation of the Hard of Hearing

ALAN AUSTIN SCHEER, M.D., F.A.C.S., F.I.C.S., D.A.B.

NEW YORK CITY, NEW YORK

REHABILITATION of hearing is one of the most fascinating subjects in the field of otology. Working with persons who are hard of hearing and being able to do something for them is a most satisfying experience.

The person who is hard of hearing often has problems that reach far beyond himself and his own difficulties, which of course are important. His hearing defect affects those around him; it affects his family, it affects the persons he works with. Frequently his ability to hold a position is entirely dependent upon his ability to hear. Not only holding a position but advancing oneself often depends on adequate hearing. Unfortunately, a person who is hard of hearing has a tendency to undergo definite personality changes; otologists try to prevent this at all costs, because such changes, once they have occurred, are often irreversible. Too often one sees persons who have become introverted as they lost their hearing. They do not mingle with others; they stay by themselves. Their social activities are cut down to a minimum. There is a definite loss of self-confidence. Once a human being becomes withdrawn and introverted a serious problem is present, involving the personality as well as the hearing.

Often those who are hard of hearing will show a loss of facial expression. There are also changes in the voice, depending on the type of hearing loss. A person with nerve deafness will speak very loudly, because he does not hear his own voice. A person with a conductive loss speaks very softly and sometimes can hardly be heard.

Before discussing the general classification of hearing losses, a brief résumé of the basic physiologic aspects is in order.

Sound waves are created as one speaks. They are funnel-led into the external auditory canal against the tympanic membrane. If the sound is to be heard, it must then be transferred beyond the tympanic membrane, through the middle ear space. There is a beautiful and delicate mechanism in the middle ear that carries the sound through it to the cochlea, which is the end organ of hearing. The ossicular chain is a mechanism exerting strong leverage and multiplies the force of the sound waves twenty times as they pass from the tympanic membrane to the cochlea. The malleus is in contact with the tympanic membrane. The middle bone, the incus, articulates with the stapes, which in turn fits into the oval window. Movement of the stapes will stimulate the organ of Corti within the cochlea. The actual vibration of the ossicular chain is so minute that it cannot be visualized under the ordinary microscopic lens.

Understanding the basic physiologic nature of hearing, one realizes that two types of hearing loss can occur. The first is the type in which the end organ of hearing (the cochlea) is disturbed. This is called a "perceptive type" or a "nerve type" of deafness; the cochlea itself is not able to receive the sound that comes to it. A rather large number of ents have hearing losses of this kin sult degenerative processes, v te

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infections, toxic disturbances, etc. Unfortunately, in the presence of nerve deafness the degenerative process is irreversible.

On the other hand, a large proportion of the hard of hearing have a conductive type of hearing loss. With this type the sound is impeded at some point along the ossicular chain before it reaches the cochlea. For the patients in this group the otologist can do a great deal—much more than for those with nerve deafness.

Patients with degenerative intracochlear changes can be helped in some instances only by a hearing aid; there are certain cases in which even a hearing aid cannot help. This is because a hearing aid is nothing more than an amplifier, and there must be some degree of residual sound left that can be amplified within the cochlea. If little or none exists, poor results will be obtained through the use of an instrument.

A hearing aid can also be used by a patient with conductive hearing loss and is more effective than when used with the "nerve type" loss.

If one has the opportunity to restore hearing, however, either through the use of a hearing aid or by a specialized surgical procedure, it is usually more desirable to use the surgical approach, since a more natural type of hearing can be obtained.

This article is limited to the rehabilitation of patients with conductive hearing loss, namely, the type due to otosclerosis. The hearing loss caused by otosclerosis, if left to run its course, is progressive and irreversible. It is an extremely complex process, going through several pathologic stages.

I have described the three bony ossicles that reside within the middle ear and the manner in which they carry the sound waves through to the cochlea. The stapes fits snugly into the oval window and actually can be thought of as being on a hinge moving within that window. Should this window stiffen and finally cease to move at all, the result stimulates otosclerosis. Actually this process begins with the formation of a new and foreign type of bone in the region of the annular ligament. As the pathologic changes progress, it seals off the stapedial vestibular articulation until finally the stapes is fixed solidly within the oval window. Sound, therefore, is stopped at this point and cannot reach the hearing nerve. This process is a slow one, occurring primarily in young persons and more frequently in women than in men. It is interesting to note that if a hormonal upheaval occurs within the body, as during pregnancy or lactation, there will often be swifter deterioration of the hearing.

Once the stapes is fixed, the cochlea receives less and less stimulation. This results in secondary nerve deterioration, which causes the hearing loss to become progressively worse.

The fenestration operation, in which a new window is created in the horizontal semicircular canal, is now familiar to all. With this procedure the surgeon reroutes the sound so that the middle ear and the oval window are bypassed; instead, the sound waves enter the fenestra in the horizontal semicircular canal and are absorbed into the perilymphatic fluid. It is important to realize that the fluid within the semicircular canal is contiguous with the fluid within the cochlea, so that actually the sound is now going in at the back door, so to speak. It is understandable that hearing obtained in this manner cannot attain a normal level, since no operative substitute can be as efficient as nature's own ossicular mechanism. Nevertheless this procedure, which was developed to its present-day practical state by Dr. Julius Lempert, has been a tremendous contribution and a great help to those who suffer with this type of hearing loss.

I should now like to mention a new technic for the rehabilitation of patients with this same otosclerotic deafness, a procedure called mobilization of the stapes. An attempt is made to mobilize the fixed stapes by approaching it directly through the middle ear. The whole basis of this procedure is utilization of the ossicular chain to transfer sound to the cochlea in the normal manner. This idea is not a new one, having occurred to various men in the 1880's and 1890's. Miot and Boucheron in France, Faraci in Italy and Jack at the Massachusetts Eye and Ear Clinic (1904 and 1905) actually extracted the stapes. It was never really a practical procedure in those days, however, and eventually all efforts to loosen the stapes were abandoned. It was not until 1953 that Dr. Samuel Rosen deliberately worked out a technic by which, under direct visualization, good lighting and high magnification, he was able to accomplish mobilization of a fixed stapes, using the same technic but with certain modifications.

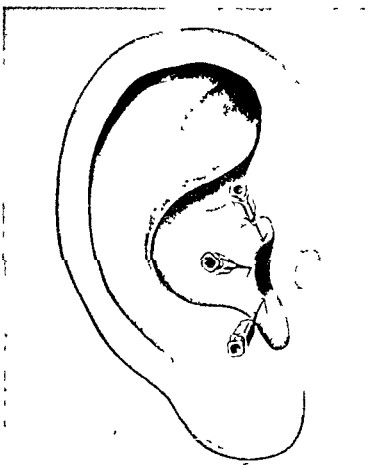


Fig. 1—Injection of 2 per cent xylocaine, epinephrine and haluronidase. Complete anesthesia of external canal, drum and middle ear.

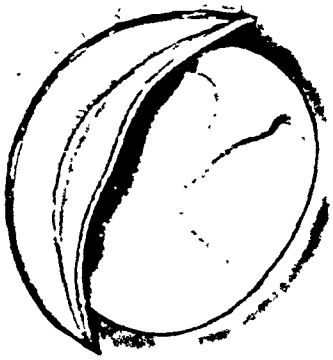
Technic.—The operation is performed with the region under local anesthesia. The patient is confined to the hospital overnight and is able to leave the next morning, "feeling fine." As a matter of fact, he is able to go back to work within a day or two after the operation. The use of local anesthesia opens up other ramifications in the otologic field. As is well known, the tympanic membrane is extremely delicate and sensitive. With 2 per cent xylocaine and epinephrine, plus halurodinase to cause the solution to infiltrate quickly and thoroughly, one is able to produce complete anesthesia of the external auditory canal, the tympanic membrane and all portions of the middle ear.

This is accomplished quickly (Fig. 1) with three small injections, which are quite painless. The initial incision is made ¼ inch (0.6 cm.) away from the drum, under magnification through an ear speculum, with use of the Zeiss binocular loop (Fig. 2*A*). It is made on the posterior canal wall from 12 to 6 o'clock. The skin is then elevated down to the tympanic membrane (Fig. 2*B*). The ear drum, which is contiguous with the skin of the posterior canal wall, is elevated and folded over upon itself, which exposes the contents of the middle ear (Fig. 3*A*). The first thing observed is a portion of the incus, the promontory and the niche of the round window. The stapedial incudal joint may come directly into view. Depending on the shape of the external canal, the stapedial tendon may be visible where it is attached to the stapes. The chorda tympani nerve can frequently be seen as it traverses the middle ear. This nerve must be avoided, if possible, because injury to it will produce distressing symptoms—loss of the sense of taste and para-

thesia of the tongue. Frequently, before the stapes can be properly exposed, it is necessary to remove some of the bony overhang of the posterior canal wall with a curet (Figs. 3*B* and 4). The next step is to attempt to loosen the fixed stapes. This is done by placing an instrument on the anterior aspect of the neck of the stapes and then exerting an intermittent pulsating type of pressure. The force is exerted toward the stapedius tendon, which is in the physiologic plane of movement of the stapes. The placing of the instrument must be exact. It must be placed on the neck of the stapes, which is 1 mm. in length. Placement on the crura will fracture the stapes, and there will be no improvement of hearing. The mobilizer must be accurately controlled by the surgeon. If the stapes becomes mobile as a result of this technic, there is visible shortening of the stapedius tendon and a definite tactile sensation is felt by the surgeon. In many cases the stapes is so solidly fixed that it feels as if the instrument is being applied to a solid rock. In others the stapes conveys a definitely springy sensation.

Incision of skin on the posterior wall of the external auditory canal.

A



Elevation of skin toward tympanic membrane.

B

Fig. 2.—*A*, incision of skin on posterior wall of external auditory canal. *B*, elevation of skin toward tympanic membrane.

If the stapes is too firmly fixed, repeated pressure will fracture it. Fortunately, the hearing of patients selected for an operation of this kind is so severely depressed that fracturing the crura of the stapes will not increase the hearing loss.

After the stapes has been mobilized, the tympanic membrane and the skin of the canal wall are replaced in their normal positions. If the stapes has been completely mobilized, the sudden return of hearing at this point is often extremely dramatic. A patient who could not hear beyond 12 inches (30 cm.) will often hear a soft voice from the other side of the room and outside noises.

His excitement and emotion at this sudden return of hearing is often tremendous. It is often difficult for him to realize that he is really hearing. This enthusiasm is transferred to the physician, who is as deeply thrilled as the patient.

One must be certain before completion

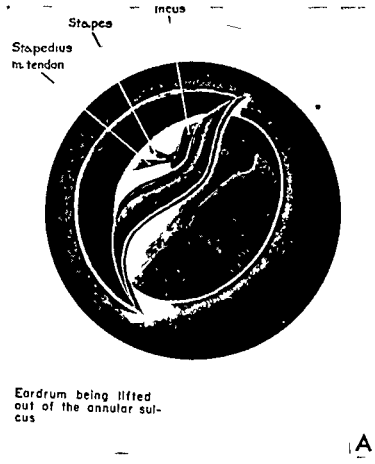


Fig 3.—*A*, eardrum being lifted out of the annular sulcus *B*, tympanic membrane folded forward, exposing middle ear. Fixed stapes ready to be mobilized

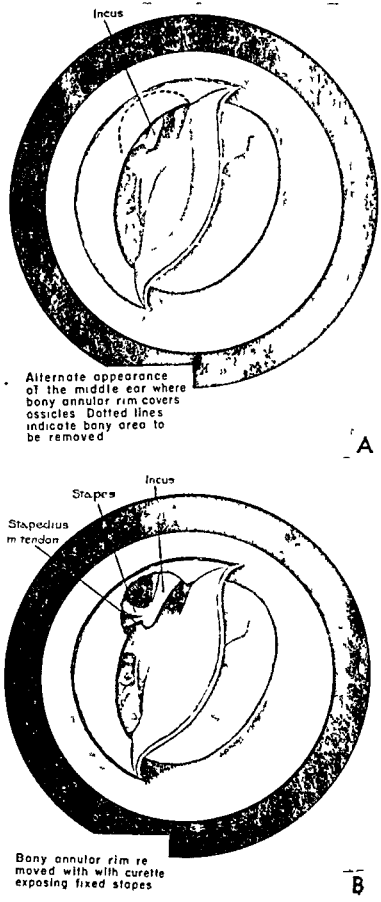


Fig 4.—*A*, alternate appearance of middle ear where bony annular rim covers ossicles Dotted line indicates bony area to be removed *B*, bony annular rim removed with curet, exposing fixed stapes

of the operation that no bony spicules have been left under the skin flap, because they will act as sequestrae and start an infection. The inner wall of the middle ear must be inspected to make sure that there is no blood in the round window niche or

in or about the oval window. There is very little postoperative pain; the patient may enjoy a full meal the same evening. It is wise to continue administration of a prophylactic antibiotic during the first few days after the patient is discharged from the hospital. On the day after the operation a clot usually forms in the external auditory canal, which will lower the hearing temporarily if a good result has been obtained. After this clot has been removed the hearing will jump up again to its new improved level. I have found that it is best not to clean the ear too much after the operation, lest any infection should occur before a good degree of healing has taken place.

As far as complications are concerned, in my experience with over 500 cases, they have been kept to a minimum. There has been 1 case of acute parotitis following injection of the local anesthetic, and 1 case of facial paresis, which was resolved within a few days. There was also 1 case of labyrinthitis following work at and around the footplate of the stapes. Perforation of the tympanic membrane cannot be considered a true complication, since such a perforation generally heals within a few days. If infection should develop, it can be readily controlled with the antibiotics and local treatment.

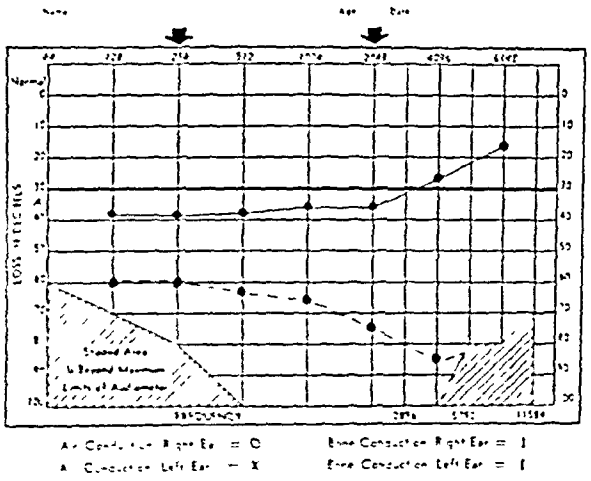


Fig. 5.—Audiogram. Note critical 30-decibel line. Solid audiometric curve represents an early conductive (otosclerotic) type hearing loss. Interrupted line indicates same hearing loss with secondary nerve deterioration after it has progressed.

What are the hearing results? After all, this is the most important point. I have observed that approximately 36 per cent of good results can be obtained with these patients. In other words, approximately 1 out of 3 patients accepted for operation will have his hearing restored or will be rehabilitated to a point at which his hearing will help him socially and economically.

Before pointing out how much hearing the patient can obtain from this operation, I should like to call attention to an audiogram (Fig. 5). An audiogram is nothing more than a chart showing the degree of hearing loss in the various frequencies of hearing, beginning at a low frequency of 128 vibrations per second and going up to 8,000. The actual loss of hearing is calculated in terms of the decibel, which is really the smallest increment of sound that the human ear can distinguish. Often this is thought of in terms of percentage, but this is not actually correct. Note that there is a 30-decibel line. This is the so-called critical level of hearing, since a patient whose hearing in the speech frequencies is at or slightly below this level, is definitely hard of hearing. When it drops down to the 35-decibel and the 40-decibel level in this area, then he decidedly needs help, whether that of a hearing aid or that obtained by surgical intervention. The actual amount of hearing improvement obtainable by operation will depend on the vitality of the auditory nerve. If bone conduction, which is a measure of function of the auditory nerve, is good to begin with, excellent hearing may be obtained (Fig. 6). If there existed before the operation a degree of secondary nerve deterioration, the possibility of obtaining a high level of hearing does not exist (Fig. 7). Each case must be studied

separately and evaluated in its own light. In approximately 1 out of 3 cases the hearing will rise above the 30-decibel line, which means that, for all practical purposes, the patient will be rehabilitated socially and economically. If the hearing comes from the 60-decibel up to the 35-decibel level it can still be considered an excellent improvement, and for the patient it is simply wonderful, but in view of the established audiometric criteria he cannot be considered completely rehabilitated.

Now what happens to this new hearing? Does it hold up? That, of course, is the most important question. So far, observations of the postoperative results extend back over two and a half years. One out of every 5 patients who obtained good results has shown a tendency to lose the initial improvement. This usually occurs within the first month, or it may appear gradually over approximately six months. On revision of these cases it was observed that there was a refixation of the stapes either equal to that observed at the first operation or greater. In such cases it becomes necessary to do a revision. Revision is a simple procedure, since, if it is necessary to remove any bony annular rim, this has already been done at the first operation. In this series, interestingly enough, the hearing level in the majority of cases in which revision was done showed no tendency to slip a second time.

If the first mobilization of the stapes of one ear has failed to produce results, the course in rehabilitation should not be abandoned. It is generally advisable to attempt mobilization of the stapes of the other ear at a later date, since the hearing loss associated with otosclerosis is usually bilateral. The fact that one mobilization has failed does not mean that the other will respond in the same way, since, as is well known, the actual degree of fixation of the stapes is often not related to

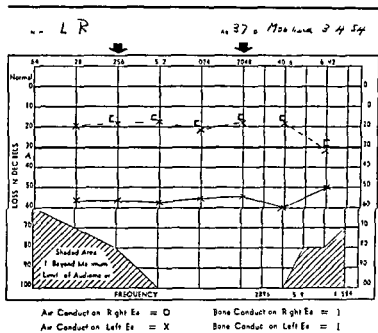


Fig 6.—Audiogram showing high level of bone conduction. Result obtained here has utilized this entire bone conduction potential The solid line represents the preoperative hearing, interrupted line, postoperative result, entirely above the 30-decibel level in the speech frequencies

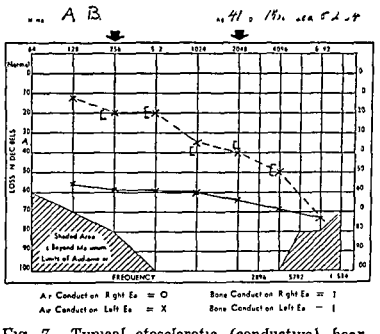


Fig. 7.—Typical otosclerotic (conductive) hearing loss with secondary nerve deafness Solid line represents preoperative hearing; interrupted line follows the postoperative bone conduction curve It cannot exceed its bone conduction potential

the degree of the hearing loss. For instance, in a single patient with a severe hearing loss the stapes in one ear may be fixed to such an extent that it feels like a stone, whereas in the other ear it can be readily mobilized. Knowing this, I advise my patients to have the other ear operated on should the first [illegible]ure fail.

As can be imagined, however, there are cases in which the desired result is not obtained after either mobilization. One must prepare the patient for this possibility and try to make him understand that what he is actually going through is a course of rehabilitation, and that anything worth while in this world, particularly hearing, does not come easily. The majority of the patients will go along with this advice, knowing that the otologist has their interests at heart.

What is the next step, then, if surgical mobilization has not been successful? Fortunately it is still possible to do a fenestration operation, with the same possibility of obtaining a good result as if no previous operation had been done on the ear. Excellent results have been obtained with this technic.

The full course of surgical rehabilitation for an otosclerotic patient, then, consists first of mobilization of the stapes in one ear and possibly in the other; then, if necessary, fenestration. At present, fenestration is considered more in the light of a major operation than is mobilization of the stapes; also, it is more confining for a patient and poses certain postoperative problems. I prefer, therefore, to try the simpler of the two procedures first, even though a higher percentage of good results may be obtained by fenestration. If mobilization of the stapes fails, nothing is lost, since it is still possible to perform fenestration.

I have mentioned the fact that rehabilitation of the hard of hearing is extremely gratifying. There are disappointments too, of course. Those fortunate enough to have their hearing restored are certainly the most grateful patients that one can have, and observing them makes one continue eagerly with these endeavors. The work that is now going on and being further developed offers more hope to the hard of hearing than ever before. Through constant study and effort one can actually rehabilitate "the whole patient" by restoring self-confidence and social ease and at the same time relieving the tension and anxieties that accompany a hearing loss.

SUMMARY

The author emphasizes the difficulties, personal, social and vocational, of the unrehabilitated person with a defect of hearing. One of the chief dangers is change in personality.

The chief emphasis of this article is placed on rehabilitation of patients with a conductive type of hearing loss, i.e., otosclerosis. Fenestration and its benefits are mentioned, and a procedure more recently devised—mobilization of the stapes —is described, with details of the technic. Local anesthesia is used; the patient is hospitalized for one night only and is usually able to return to work within a day or two after the operation.

In the author's experience with more than 500 cases, complications have been minimal (1 case of parotitis after injection of the local anesthetic, 1 case of facial paresis, resolved within a few days, and 1 case of labyrinthitis following operative work at and around the footplate of the stapes). Perforation of the tympanic membrane may occur but cannot be considered a complication, since it generally heals within a few days. Infection, should it occur, can be readily controlled with antibiotics and local treatment.

In approximately 1 out of 3 patients the results, with regard to hearing, are excellent. As to the duration of the improvement, only 1 out of 5 shows a tendency toward recurrent deafness.

The author points out the great importance of treating the hard-of-hearing patient as a whole, since his rehabilitation depends not only upon the improvement of his hearing but on the restoration of his self-confidence and social ease.

ZUSAMMENFASSUNG

Der Verfasser weist auf die personlichen, gesellschaftlichen und beruflichen Schwierigkeiten hin, denen Personen mit Schadigungen des Gehors ausgesetzt sind Eine der Hauptgefahren liegt in der Veranderung der Personlichkeit Derartige Folgen konnen, wenn sie einmal eingetreten sind, unter Umstanden nicht mehr ruckgangig gemacht werden

Das Hauptgewicht dieser Arbeit wird auf die Wiederherstellung von Kranken mit Schadigungen der Schalleitung, d h mit Otosklerose, gelegt Die Fensterungsoperation und ihre Vorteile werden erwahnt Ein anderes Operationsverfahren jungeren Datums, die Mobilisierung des Steigbugels, wird mit Angabe der technischen Einzelheiten beschrieben Sie wird unter ortlicher Betaubung ausgefuhrt, die Kranken bleiben nur fur eine Nacht im Krankenhaus und konnen gewohnlich innerhalb von ein bis zwei Tagen nach dem Eingriff zur Arbeit zuruckkehren

In den 500 Fallen des Verfassers ist nur ein ausserst geringes Auftreten von Komplikationen beobachtet worden ein Fall von Parotitis nach Einspritzung des ortlichen Betaubungsmittels, ein Fall von Fazialislahmung, die innerhalb weniger Tage zuruckging, und ein Fall von Labyrinthitis im Anschluss an operative Arbeit an und in der Umgebung der Fussplatte des Steigbugels Eine Perforation des Trommelfells kann vorkommen, sollte aber nicht als Komplikation angesehen werden, weil sie gewohnlich innerhalb weniger Tage heilt

Etwa auftretende Infektionen konnen mit Antibiotika und ortlicher Behandlung leicht kontrolliert werden

Die Erfolge sind, was die Horfahigkeit anbetrifft, in etwa einem Drittel der Falle ausgezeichnet Hinsichtlich der Dauer der Horverbesserung lasst sich nur in einem Funftel der Falle eine Tendenz zu ruckfalliger Taubheit beobachten

Der Verfasser unterstreicht die Wichtigkeit, die Gesamtpersonlichkeit des Schwerhorigen zu behandeln, weil seine Wiederherstellung nicht allein von der Besserung der Horfahigkeit sondern auch vom Wiederaufbau seines Selbstvertrauens und der Erleichterung seiner sozialen Schwierigkeiten abhangt

RIASSUNTO

L'Autore sottolinea le difficolta personali, sociali e vocali cui va incontro una persona con un difetto di udito Di queste la piu grave e indubbiamente un cambiamento della personalita che, una volta iniziato, puo divenire irreversibile

La maggior importanza, nell'articolo, viene data alla riabilitazione dei pazienti che abbiano una perdita dell'udito dovuta ad alterazioni del condotto, quale ad esempio da l'otosclerosi Viene menzionata la fenestrazione con i suoi benefici e descritto, con particolari sulla tecnica, un nuovo procedimento la mobilizzazione delle staffe Si fa un'anestesia locale, il paziente viene ricoverato solo per una notte e in genere puo tornare al lavoro una o due giorni dopo l'intervento

L'esperienza dell'autore, fatta su 500 casi, dimostra che si ha un minimo di complicazioni (1 caso di parotite dopo l'iniezione dello anestetico locale, 1 caso di paresi facciale risolto in pochi giorni e 1 caso di labirintite conseguente le manovre operatorie attorno al piatto della staffa) Si puo avere perforazione della membrana del timpano, ma questa non e da considerarsi una complicanza dato che si risolve in pochi giorni Qualora si abbia infezione e facile controllarla subito con antibiotici e trattamento locale

Per quanto riguarda l'udito i risultati sono eccellenti in uno su tre pazienti circa, per quanto riguarda, invece, la durata del miglioramento solo uno su cinque pazienti mostra una tendenza alla recidiva della sordita

Viene anche messa in luce l'importanza di trattare i malati duri di orecchio da un punto di vista generale e non soltanto per quello che riguarda l'udito perchè la loro guarigione dipende anche dal recupero della fiducia in se stessi e della confidenza nella società.

SUMARIO

O autor salienta as dificuldades, pessoal, social e vocacional, da pessoa desajustada com um defeito de audição. Um dos principais perigos é a alteração da personalidade, que pode se tornar irreversível se *permitir que ocorra uma vez.*

O ênfase mais importante dêste artigo está colocado na reabilitação dos pacientes com um tipo condutivo de perda de audição, por exemplo, otosclerose. A fenestração e seus benefícios são mencionados, e um método criado mais recentemente—mobilização dos estapédiosaé—é descrito, com detalhes de técnica. A anestesia local é usada; os pacientes são hospitalizados durante uma noite apenas e usualmente podem retornar ao trabalho dentro de um dia ou dois depois da operação.

Na experiência do autor com mais de 500 casos, as complicações foram mínimas (1 caso de parotidite após a injeção de anestésico local, 1 caso de paresia facial. resolvido em poucos dias, e 1 caso de labirintite após o trabalho operatório no local e em redor da plataforma dos estapédios). A perfuração da membrana timpânica pode ocorrer mas não pode ser considerada uma complicação, uma vez que geralmente cicatriza dentro de poucos dias.

A infecção, se ocorrer, pode ser prontamente controlada com antibióticos e tratamento local.

Em aproximadamente 1 de 3 pacientes. os resultados, em relação à audição. são excelentes. Quanto à duração da melhora, apenas 1 em 5 casos mostra cendência em relação à surdez recorrente.

O autor chama a atenção para a grande importância de se tratar o paciente difícil de escutar como um todo, uma vez que sua reabilitação depende não sòmente da melhora de sua audição, como também da restauração da confiança em si e à vontade social.

RÉSUMÉ

L'auteur souligne les difficultés personnelles, sociales et professionnelles de la non-réhabilitation d'un malade dont l'ouïe ets atteinte. Un des plus grands dangers réside dans ces cas dans la modification de la personnalité du patient qui peut être irréversible une fois établie.

Le principal objet de cet article est l'*étude de la réhabilitation de malades atteints* d'un trouble de l'ouïe du type conducteur, tel par exemple l'otosclérose. La fénestration et ses bienfaits sont mentionnés, et l'auteur décrit une technique récente avec mobilisation des étriers. pratiquée sous anesthésie locale. Le patient est hospitalisé pendant une nuit seulement et peut généralement reprendre son travail un ou deux jours après l'opération.

L'expérience de l'auteur s'étend sur plus de 500 cas: les complications post-opératoires ont été minimes (1 cas de parotidite après injection de l'anesthésique. un cas de parésie faciale durant quelques jours, et un cas de labyrinthite après intervention sur la lame des étriers). Une perforation de la membrane tympanique est possible, mais elle ne peut être considérée comme une complication étant donné qu'elle se cicatrise en peu de jours. En cas d'infection. antibiotiques et traitement local.

Les résultats sont excellents dans environ un cas sur trois. Un cas sur cinq seulement montre une tendance à la récidive.

L'auteur attache une grande importance au traitement psychothérapique, car la réhabilitation due sujet ne dépend pas seulement de l'amélioration de son ouïe, mais également du fait qu'il doit retrouver tout sa confiance en soi et en son rôle social.

Fenestration

GEORGE E SHAMBAUGH, JR, M D

CHICAGO, ILLINOIS

TO determine the late results of the fenestration operation in cases considered ideally suitable I reviewed 100 consecutive cases that had been classified as of Type A suitability in which the operation was performed after Jan 1, 1947, and the patients followed for at least five years The technic employed in these operations was essentially the same as is used today, with enchondralization, doming and polishing of the bone around the fenestra, removal of all particles of bone dust with the aid of the operating microscope, continuous irrigation and careful toilet of the plastic skin flap, preservation of the endosteum to the fenestral margins, and elastic sponge packing

There were 12 "initial failures" In examining the records of these cases I note that 7 patients had sufficient postoperative serous labyrinthitis to prevent an ideal hearing result In 1 of these the hearing was worse, in 3 it was unchanged (within 7 decibels of the preoperative level), in 4 it was improved 16 to 28 decibels to reach a level of 32 to 35 decibels loss for the speech frequencies, but short of the level of practical hearing

In 4 of the 12 initial failures, reexamination of the preoperative bone conduction audiograms showed sufficient beginning cochlear degeneration to have satisfied classification as Type B In 1 of these cases the 30 decibel level was reached in the five-year test, but was a few decibels short of this limit of practical hearing in the six-month and the two year test

In 1 case of initial failure the patient had transient labyrinthine hydrops at the time of the six month test, but returned to a very good gain of 32 decibels and an 18 decibel level at the time of the five-year test

Study of the 14 "late failures," the cases in which practical hearing was obtained at six months but dropped below the 30 decibel line at five years, shows that 9 of the patients actually lost only 3 to 7 decibels of their gain, but this was enough to place them out of the fully rehabilitated classification In 5 of these the results of preoperative bone conduction tests would have justified classification under Type B In 3 of the "late failures" progressive cochlear nerve degeneration had developed slowly In 1 the clinical picture of labyrinthine hydrops was present In 2 instances the late failure was considered the result of closure of the fenestra One patient had gained 15 decibels to reach the 28 decibel level six months and two years after the operation, but on the five year test had dropped to a 42 decibel level, just 2 decibels above the preoperative one This is assumed to represent a late closure The other patient gained 30 decibels to reach the 22 decibel level at six months, declining to a 33 decibel level at two years and a 35 decibel level at five years, when the hearing was 17 decibels above the preoperative loss This is attributed to partial closure

To summarize, in this particular series of 100 Type A cases in which fenestration was done, 26 patients enjoyed practical hearing five years after the operation within the arbitrary limit of a 30 loss for the speech frequencies

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most frequent causes of failure were postoperative serous labyrinthitis and incorrect classification. Closure of the fenestra appears to have become a less important cause of failure since modern fenestration technic has been developed.

To aid in the selection and classification of cases according to their suitability for operation I now employ a simple formula based on the unrestored residue of conductive loss after successful fenestration. This concept, which originated with Davis and Walsh in 1950, I consider one of the more important recent contributions to fenestration. If one takes 25 decibels as the *average* value for this residual conductive loss, the result of fenestration in a particular patient may be predicted as a hearing level 25 decibels below his cochlear reserve. The bone conduction audiogram is the best available measure of the cochlear reserve. The audiogram should first be calibrated so that it gives an average zero reading by both air and bone for normal ears, and an equal loss by air and bone in a purely perceptive loss. Carhart has shown that in cases of otosclerotic fixation of the stapes there is a shift in the bone curve, greatest at 2,000 cycles, that disappears after fenestration and therefore appears to be the result of altered cochlear mechanics, rather than attributable to a neurosensory origin. The best estimate of the cochlear reserve is obtained by correcting the bone conduction audiogram for this mechanical shift, a reasonable average correction being 5 decibels at 512, 10 decibels at 1024 and 15 decibels at 2048, or an average of 10 decibels for the three speech frequencies. To save time, one may simply predict the result of fenestration in a particular patient as a hearing level 15 below the average uncorrected bone loss for the speech frequencies.

If the prediction formula is applied to the failures listed under "incorrect classification" none of the patients would be expected to reach the 30 decibel level of practical hearing. Had this prediction formula been available five years ago, when these 100 patients were operated on, the 9 cases of Type B suitability would not have been included. Thus, five years after the operation, the percentage of fully rehabilitated patients would have been more than 80, instead of 76.

SUMMARY

Today's fenestration operation, in the author's opinion, offers the patient of Class A suitability somewhat more than eight chances in ten of attaining practical, serviceable hearing and maintaining it for at least five years. Comparison of the hearing after fenestration with the hearing by the same patients with hearing aids before operation, with the use of calibrated speech and discrimination tests, shows that, *on the average,* patients of Class A suitability hear as well or slightly better after the operation. Fenestration, therefore, appears to be the rehabilitative method of choice for the patient with otosclerosis without cochlear degeneration, *provided* this patient is willing to accept the 1:5 chance of failure, either early or late.

RÉSUMÉ

La technique actuelle de la fénestration offre, d'après l'auteur, aux patients de la catégorie A un peu plus de 8 chances sur 10 d'obtenir et de conserver une ouïe satisfaisante pendant au moins 5 ans. Des comparaisons au moyen d'appareils et de tests avant et après la fénestration montrent qu'*en moyenne* les patients de la catégorie A entendent aussi bien, voire mieux après l'opération. C'est pourquoi la fénestration paraît être la méthode de choix pour les malades atteints d'otosclérose sans dégénérescence cochléaire, *à con-*

dition qu'ils soient d'accord d'accepter un risque d'echec precoce ou tardif de 20%

RIASSUNTO

L'intervento attuale di fenestrazione offre, secondo l'autore, ai pazienti del Gruppo A piu di 8 probabilita su 10 di mantenere un udito sufficiente per almeno 5 anni Il paragone fra l'udito del paziente dopo l'intervento e quello dello stesso paziente *prima dell'intervento* aiutato da apparecchi acustici, usando per la prova suoni adatti, dimostra che nella media i pazienti del Gruppo A odono come o anche meglio di prima

La fenestrazione appare quindi il metodo di scelta per la cura dell'otosclerosi con degenerazione cocleare, ammesso che il paziente accetti di correre un rischio di insuccesso prima o poi

SUMARIO

Hoje em dia, a operação de fenestração na opinião do autor, oferece ao paciente de adaptabilidade Classe A pouco mais de 8 chances em 10 de obter e manter a audição pratica e serviçal pelo menos durante 5 anos A comparação da audição apos a fenestração com a dos mesmos pacientes que se utilizavam de aparelhos antes da operação, com o uso da palavra calibrada e teste de descriminação, mostra que *em media*, pacientes de adaptabilidade Classe A ouvem tão bem ou pouco melhor apos a operação A fenestração, portanto, parece ser o metodo rehabilitador de escolha para o paciente com otoesclerose sem degeneração *uma vez que* o paciente este ja disposto a aceitar a chance de 1 5 de fracasso, quer cedo ou tarde

ZUSAMMENFASSUNG

Der Verfasser glaubt dass die heutige Form der Fensterungsoperation dem Kranken der Eignungsklasse A eine etwa 80 prozentige Chance bietet, fur die Dauer von mindestens funf Jahren ein praktisch taugliches Horvermogen zu erreichen Ein Vergleich der Horfahigkeit eines Patienten *nach der Fensterung mit seinem* Hor vermogen vor der Operation (unter Verwendung von Horapparaten kalibrierter Sprache und Ableseubungen) ergibt, dass *im Durchschnitt* die Kranken der Eignungsklasse A nach dem Eingriff ebenso gut oder etwas besser horen Demnach ist offenbar fur den Kranken mit Otosklerose ohne Degeneration der *Kochlea die Fenste*rung das Wiederherstellungsverfahren der Wahl, *vorausgesetzt* dass der Kranke bereit ist, das 20 prozentige Risiko fruhen oder spaten Versagens der Operation in Kauf zu nehmen

A true friend unbosoms freely, advises justly, assists readily, adventures boldly, takes all patiently, defends courageously, and continues a friend unchangeably

—*Penn*

Management of Sinusitis

[illegible]

Twenty-five years ago, in the Graduate School of Medicine, Sluder taught that the fundamental treatment of sinusitis consisted of the establishment of ventilation and drainage. He was able to this concept the use of antibiotics, this, in my opinion, is still a sound basis for treatment.

It has been customary to achieve this ventilation and drainage in various ways, the simplest of which was the use of vasoconstrictor nasal drops or sprays; there have been proposals to physiotherapy and to surgical intervention. Ephedrine and the topical sympathetic preparations similar to it have been used to reduce the swelling of the nasal mucosa which are only temporary with drainage but makes the patient extremely comfortable. The nerve terminals are apt to develop rapidly because of these drugs. In view of the problem with vasodilation, which is often filling. These temporary medicaments are often effective in cases of acute and subacute sinusitis and the acute exacerbation of chronic sinusitis.

In the patient with intense irritation of the membranes and in the allergic patient, temporary, temporary medicaments may cause pain, irritation, increased swelling. We all know the patient who protests against nose drops because they cause pain, irritation, temporary, if the patient is a child the importance of nose drops is sometimes a difficult problem. It would seem that with patients who I am not to do it is better to use drops sparingly

[illegible]

[illegible]

ing the membrane by means of oral medication is much considering.

Another indication for this type of therapy is encountered in the case of the patient who is enjoying the wide-open nose produced by dosing the nose with vasoconstrictors that he uses the drops every half hour; soon the nerves are so overstimulated that they cease to respond, and one sees the real, bogey membrane of "rhinitis medicamentosa."

There are several types of medicament that will open the nose for drainage. The antihistamines are probably the most effective. A recent survey states that [illegible] per cent of bilateral purulent sinus infections occur in allergic persons, so it is logical to use these drugs to establish ventilation. This appears to be particularly effective in the allergic child with recurrent attacks of purulent sinusitis, and a prescription for an antihistamine and an expectorant will usually give excellent results.

Another effective drug for keeping the nose open and the sinuses ventilated is systemic ephedrine. This in dose of [illegible] will usually maintain the nasal membranes for several hours. It may be combined with a sedative if desired. Dill has stated that the ephedrine preventilation of the use of ephedrine are few, and it should probably not be given to patients with organic heart disease, hyperthyroidism, hypertension or pronounced insufficiency.

It is possible that the oral use of systemic ephedrine may also produce the membranes lining the sinuses and nasal cavities and thus be able to prevent the [illegible] but

Another preparation that is sometimes highly effective is the combination of codeine and papaverine suggested in 1933 by Diehl for the treatment of acute rhinitis. The pharmacologic basis has not been explained, but clinically this combination will often shrink turgescent turbinates and permit effective aeration of the sinuses. The pain-relieving action of these drugs is an advantage to the patient whose acute sinusitis is associated with much discomfort.

There is no certain way to select the most desirable method for the establishment of ventilation and drainage in any particular case. Some patients do well on intranasal medication, others do not. An allergic-looking membrane may suggest the antihistamines; a fiery red, swollen membrane may respond to oral administration of racemic ephedrine. The patient who has had no rest because of local discomfort will probably do well with the codeine and papaverine mixture. The most useful guide is the recorded history of a given patient's response to these medicaments in similar previous attacks.

Briefly, therefore, it is suggested that in the treatment of sinusitis, particularly the acute and subacute forms, the oral administration of vasoconstrictors be considered.

SUMMARY

The author considers ventilation and drainage a sound basis for the management of sinusitis. The current availability of the antibiotics implements but does not alter this time-honored principle.

The problem of nasal sprays and their possible undesirable effects is discussed briefly, and the drugs which the author has found most satisfactory are mentioned. In her opinion, the most useful guide to the treatment of any given patient is the recorded history of his response to various forms of medication in similar previous attacks. She recommends consideration of the use of vasoconstrictors, orally administered, especially for acute and subacute types of sinusitis.

ZUSAMMENFASSUNG

Der Verfasser sieht in der Luftung und Drainage eine gesunde Grundlage zur Behandlung von Entzundungen der Nasennebenhohlen. Die augenblickliche Verfugbarkeit der Antibiotika bietet eine zusatzliche Behandlungsmoglichkeit, andert aber nichts an dem alten gutbewahrten Prinzip.

Das Problem von Einblasungen in die Nase mittels eines Zerstaubers und die unerwunschten Nebeneffekte, die damit verbunden sein konnen, werden kurz erortert, und die von der Verfasserin fur am geeignetsten angesehenen Medikamente werden erwahnt. Die Verfasserin sieht in den Beobachtungen des individuellen Patienten hinsichtlich seiner Reaktion auf verschiedene Medikamente bei vorangegangenen ahnlichen Anfallen den besten Hinweis auf das geeignete Behandlungsverfahren. Sie empfiehlt, besonders fur akute und subakute Formen der Nebenhohlenentzundung die Verwendung gefassverengender Mittel per os in Betracht zu ziehen.

RÉSUMÉ

La ventilation et le drainage sont une bonne base pour le traitement de la sinusite. L'usage courant des antibiotiques ne modifie en rien ce principe reconnu.

Le problème des vaporisations nasales et de leurs éventuels effets nocifs est brièvement mentionné. L'auteur cite les médications au moyen desquelles il a obtenu les résultats les plus satisfaisants. A son avis la meilleure indication de traitement est fournie par l'étude des réac-

tions du patient aux produits administrés lors de crises antérieures. Il recommande les vasoconstricteurs par voie orale, surtout dans les cas de sinusite aiguë et subaiguë.

RIASSUNTO

L'autore considera la ventilazione e il drenaggio come la base indispensabile nella cura della sinusite. La disponibilità degli antibiotici deve integrare, non modificare questo principio fondamentale.

Viene discusso brevemente il problema delle polverizzazioni nasali e dei loro possibili effetti spiacevoli, e vengono elencati i farmaci da cui l'autore ha tratto i maggiori benefici. Secondo il suo parere il sistema migliore per curare ogni paziente è quello di chiedergli qual'è il farmaco che gli ha dato i migliori risultati in precedenti attacchi.

Viene raccomandata la prudenza nell'uso dei vasocostrittori per via orale specialmente nelle sinusiti acute e subacute.

SUMARIO

O autora considera a ventilação e a drenagem uma base sólida para o tratamento da sinusite. A eficácia dos antibióticos auxilia mas não altera êste princípio.

O problema dos pulverizadores nasais e seus possíveis efeitos indesejáveis é discutido brevemente, e as drogas que o autora considera mais satisfatórias são mencionadas. Em sua opinião, o guia mais útil para o tratamento de qualquer paciente é a história registrada de sua resposta às várias formas de medicação em ataques anteriores semelhantes. Ela recomenda que se leve em consideração o uso de vasoconstrictores, oralmente administrados, especialmente para os tipos agudos e subagudos de sinusite.

What is the truth? Are we always sure of the diagnosis and, even if we are, can we state with certainty what the prognosis is? We can rarely be dogmatic. I have seen harm come from attempts so to be. A former instructor of mine, years ago, used to tell patients not only what he thought was wrong with them but also what he thought would happen to them: he stated this dogmatically and very briefly, disregarding the fact that he could not prophesy with certainty. When I was serving my medical internship in the hospital I had the occasion not infrequently to console patients in the wards to whom he had painted too dark a picture. Usually the course which the disease of these patients later took did not fit the picture that he painted. In his vigorous effort to be truthful he proved to be at times quite untruthful.

—*White*

Spontaneous Pneumothorax

ROBERT E SASS, M D AND JAMES P WALSH, M D

SHARON PENNSYLVANIA

THE term "pneumothorax" signifies air in the pleural space Spontaneous pneumothorax denotes the escape of air from some segment of the respiratory tract into the pleural space The leak may be anywhere along the respiratory tract from the trachea to the alveoli, although the usual site tends to be in the periphery of the lung rather than in the more central portion

Pneumothorax alters the normal negative pressure in the pleural space and in this manner causes a partial or total collapse of the lung on the involved side

Etiologic Factors—Broch[1] stated that, several decades ago, spontaneous pneumothorax in 78 per cent of cases was considered a result of pulmonary tuberculosis This theory arose because most reports of complications associated with thoracic diseases came from tuberculosis sanitariums and thus gave the reader an erroneous impression Recent reports[2] indicate that in only 6 to 10 per cent of cases, approximately speaking, is spontaneous pneumothorax attributable to tuberculosis The currently accepted theory is that the most common cause is rupture of an emphysematous bleb, a congenital cyst, a pleural cyst or a bulla[3]

The following outline lists possible causes of spontaneous pneumothorax as reported by Rapport[4]

1 Structural cyst
   a Congenital cystic disease
   b Cystic bronchiectasis
2 Inflammatory disease
   a Tuberculosis
   b Pneumonia
   c Pneumonitis
   d Abscess
   e Bronchiectasis
3 Emphysema
   a Obstruction blebs and bullae
   b Localized distentions due to fibrosis sarcoidosis, etc
   c Senile emphysema
   d Emphysema due to chest cage deformities of the thoracic cage
4 Trauma
   a Fractured ribs
   b Foreign bodies
   c Violent coughing
   d Puncture wounds, etc
5 Idiopathy

Types of Pneumothorax—Spontaneous pneumothorax may be divided into three main types, namely, closed pneumothorax, open pneumothorax and tension pneumothorax

With closed pneumothorax, the opening that allows the escape of air from the respiratory tract into the pleural space closes and seals over after the escape of air The lung, by collapsing and greatly decreasing in size, aids in the closure

With open pneumothorax, the opening that initially caused the pneumothorax remains patent and there actually exists a bronchopleural fistula

A "valvelike" action is present with tension pneumothorax This type of communication permits air to enter the pleural space from the tracheobronchial tree

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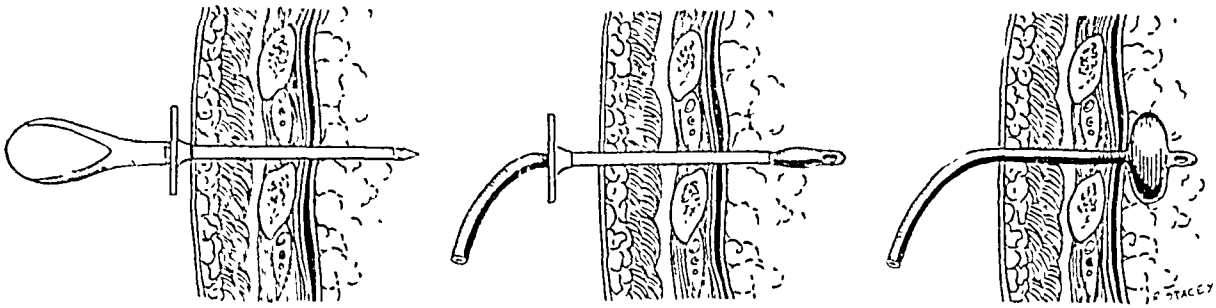

Fig. 1.—*A*, trocar and cannula introduced after infiltration of the thoracic wall with a local anesthetic. *B*, trocar removed and Foley catheter inserted through cannula. *C*, bag on Foley catheter inflated and cannula removed. Catheter is then attached to a water seal bottle or a suction apparatus.

during respiration, and the air becomes trapped in the pleural space. This results in a continuing increase of intrapleural pressure.

It is important to recognize this type of pneumothorax early after its occurrence, for it is a progressive phenomenon and, unless corrected, causes definite physiologic and anatomic changes. Because of the increasing pressure in the pleural space, severe circulatory changes occur. The extrinsic pressure on the thin-walled veins and auricles causes diminished cardiac filling, which lowers the cardiac output.[5] Death usually results unless this process is altered.

Diagnosis.—The symptoms of spontaneous pneumothorax vary from none to severe pain, dyspnea, cyanosis and collapse. Pain, however, is present in almost all patients.[6] This pain is usually sharp and knifelike and is present on the same side as is the pneumothorax. It may be referred to the shoulder, radiate down the arm, or radiate to the posterior portion of the chest, simulating coronary artery disease or biliary or renal colic. Sweating and fever are sometimes present.

Physical examination usually discloses limited respiratory excursions, and there may be distention of the cervical veins on the affected side. Tactile fremitis is decreased, and breath sounds are decreased sometimes to the point of absence. The percussion note is hyper-resonant, and a succussion splash may be heard if sufficient fluid is present in the pleural space. The heart and trachea are usually shifted toward the opposite side. The "coin sign" may be elicited.

Roentgen or fluoroscopic examination of the chest usually establishes the diagnosis. These studies disclose the degree of collapse of the lung and the pressure or absence of mediastinal shift. There may be varying amounts of fluid in the pleural space on the affected side. Cysts, bullae or blebs may be visualized; if so, they may aid in subsequent therapy.

Treatment.—The treatment of spontaneous pneumothorax must vary with the type of pneumothorax, the probable cause and the condition of the patient. General supportive measures are indicated in almost all cases. These measures should include bed rest and, in some cases, the administration of oxygen. Because of the pain that usually accompanies pneumothorax, various narcotics may be necessary. One should strive to relieve the pain but also to prevent any respiratory depression.

Expectorants should be administered in an attempt to liquefy the tracheobronchial secretions. This aids in preventing further atelectasis due to retention of bronchial secretions and promotes earlier reexpansion of the collapsed lung.

Antibiotics should be prescribed, since the collapsed lung is susceptible to infection and a direct communication has existed or exists between the respiratory tract and the pleural space. This anatomic defect provides a potential avenue for infection, which could result in empyema.

Bronchoscopic study[8] may be a valuable aid in the treatment of pneumothorax. With this procedure the thick plugs of mucus may be removed to allow greater reexpansion of the lung through proper aeration.

In some cases of closed pneumothorax, simple bed rest is all that is indicated. The lung in these cases usually has less than a 25 per cent collapse, and the symptoms are minimal.

Needle aspiration may be used for patients with closed pneumothorax. The amount of pulmonary collapse is usually at least 50 per cent before this procedure is considered, though it may be used for lesser degrees of collapse if dyspnea is severe. Needle aspiration discloses the type of fluid, if any, that is present in the pleural space. Since several aspirations may be necessary, it carries with it the risk of infection, hemorrhage and possible further injury to the visceral pleura. Simple aspiration of air from the pleural space usually hastens reexpansion of the lung and decreases the period of disability.

Closed thoracotomy may be used when the lung is collapsed beyond 50 per cent. It should be used for tension pneumothorax, recurrent collapse (unless minimal) and disease of the opposite lung. This method of treatment is effective as well as simple to institute and can be done with local anesthesia. The number of instruments necessary is minimal, and the period of hospitalization may be decreased, as the lung usually reexpands within three to five days. With this type of thoracotomy a catheter, preferably of the Foley type, is introduced via a trochar into the anterior thoracic wall, usually between the second and third ribs. The catheter is then attached to a water-sealed bottle, and decompression of the pleural space is instituted immediately (Fig. 1).

If the aforementioned equipment is not readily available, the finger of a soft rubber glove, a finger cot or a condom may be tied over the end of the needle. In this manner the formation of positive pressure is prevented by the crude but effective valve (Fig. 2).

Introduction of irritating substances into the pleural space has been advocated for recurrent pneumothorax. These substances cause an inflammatory reaction between the visceral and the parietal pleura. In this manner the parietal and the visceral pleura "stick together" and

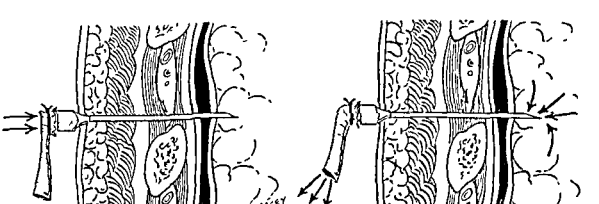

Fig. 2.—*A*, air in pleural space allowed to escape during expiration. *B*, soft rubber pulled against hub of needle during inspiration, which prevents air from entering pleural space.

fibrosis results, completely obliterating the pleural space with a firm, dense scar. It is postulated that recurrent pneumothorax is thereby prevented. Such substances as silver nitrate, talcum powder, whole blood, hypertonic dextrose, magnesium trisilicate and numerous other sclerosing agents have been used, with varying degrees of success. It has been reported[9] that there is no decrease in pulmonary function when talcum powder is employed in this type of therapy.

Closed pneumonolysis has a special indication; it is used only when an adhesion is holding open a rent in a lung. The lysis of this adhesion allows the lung to collapse further, and the lung may thus seal the hole. This type of therapy, being but rarely indicated, is seldom employed.

Open thoracotomy is indicated in the presence of a bronchopleural fistula, multiple recurrent collapse or chronic spontaneous pneumothorax; it is also advisable when the spontaneous pneumothorax is due to congenital pulmonary cycts.[10] If an open thoracotomy is performed, the fistula may be excised or closed and other causes, such as cysts or blebs, may be removed. The stripping of segments of the parietal pleura, which may be done at the same time, provides an excellent chance that the lung will "stick" to the thoracic wall and become permanently adherent. This will eliminate the possibility of a recurrence.

As can be seen from the numerous methods of treatment, the form of therapy chosen in each case must be adapted to the specific type of pneumothorax and the presence or absence of complications.

SUMMARY

1. The cause, diagnosis and treatment of spontaneous pneumothorax are discussed.

2. The indications and the technic for closed thoracotomy are described.

3. Various emergency methods of handling tension pneumothorax are suggested.

4. The indications and advantages of open thoracotomy are presented.

RÉSUMÉ

1. L'origine, le diagnostic et le traitement du pneumothorax spontané sont discutés.

2. Description des indications et de la technique de la thoracotomie fermée.

3. Plusieurs méthodes d'urgence pour le traitement du pneumothorax positif sont suggérées.

4. Discussion des indications et avantages de la thoracotomie ouverte.

RIASSUNTO

1. Viene trattata l'etiologia, la diagnosi e la cura del pneumotorace spontaneo.

2. Vengono descritte le indicazinoni e le tecniche per la toracotomia chiusa.

3. Vengono suggeriti vari sistemi per controllare il pneumotorace a pressione.

4. Vengono esposte le indicazioni e i vantaggi della toracotomia aperta.

SUMARIO

1. O autor discute a causa, diagnóstico e tratamento do pneumotórax espontâneo.

2. Descreve as indicações e a técnica para a toracotomia fechada.

3. Sugere vários métodos de emergência para tratar pneumotórax de pressão.

4. Apresenta as indicações e vantagens da toracotomia aberta.

ZUSAMMENFASSUNG

1. Die Ursache, Diagnose und Behandlung des spontanen Pneumothorax werden erörtert.

2. Die Indikationen und die Technik des geschlossenen Brustwandschnittes werden dargestellt.

3 Verschiedene Methoden der Notbehandlung des Spannungspneumothorax werden vorgeschlagen

4 Die Indikationen und Vorteile des offenen Brustwandschnittes werden dargelegt

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Weary the path that does not challenge Doubt is an incentive to truth and patient *inquiry leadeth the way*

—*Ballou*

Let us assume that entertainment is the sole end of reading, even so, I think you would hold that no mental employment is so broadening to the sympathies or so enlightening to the understanding Other pursuits belong not to all times, all ages, all conditions, but this gives stimulus to our youth and diversion to our old age, this adds a charm to success and offers a haven of consolation to failure Through the night watches, on all our journeyings, and in our hours of ease it is our unfailing companion

—*Russell*

Carcinoma of the Esophagus at the Site of Lye Stricture

Report of a Case

EDGARD BARBOSA, M.D., R. G. RATE, M.D., F.A.C.S., F.I.C.S., D.A.B.*
AND V. E. CHESKY, M.D., F.A.C.S., F.I.C.S., D.A.B.**
HALSTEAD, KANSAS

CARCINOMA of the esophagus at the site of a lye stricture is extremely rare. Only a few well documented cases could be found in the literature. To these we wish to add 1 more case, in which esophageal carcinoma developed in a 37-year-old man, thirty-six years after accidental ingestion of lye.

REPORT OF CASE

V. D. F., a 37-year-old white man, was admitted to the Halstead Hospital in October 1955 because of increasing difficulty in swallowing foods, considerable soreness in the chest, fever and coughing accompanied by a large amount of thick purulent sputum. At the age of 1 year he had swallowed lye, which resulted in complete obstruction of the esophagus and required a gastrostomy for feeding purposes. As a result of the lye burn a severe stricture developed, which required esophageal dilatations at two-year intervals to keep the esophageal lumen patent. Prior to his most recent admission to the hospital he was able to drink liquids and eat semisolid and solid foods such as potatoes, fish and ground meat.

Physical examination gave negative results except for an area of dullness and tubular breath sounds in the right upper pulmonary field. A well-healed gastrostomy scar was noted in the midepigastrium.

A roentgen film of the chest taken at the time of admission disclosed an abscess in the upper lobe of the right lung. During a therapeutic bronchoscopic procedure, purulent material was aspirated from the bronchial orifice of the right upper lobe. Esophagoscopic study on May 1, 1956, revealed an obstruction and stricture at the 26 cm. level. Retained foods and fluids were aspirated. The esophagus was dilated to the diameter of a No. 30 French

Fig. 1.—Cross section of the gross specimen, showing a firm white tumor invading the adjacent structures.

*Thoracic Surgery, the Hertzler Clinic, Halstead.
**Hertzler Clinic, Hertzler Research Foundation and Halstead Hospital, Halstead.
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Fig. 2.—Low power photomicrograph of the tumor, showing squamous cell carcinoma originating from the surface and growing in strands. Note keratinization and variation in size of the nuclei.

catheter at the site of stricture. A biopsy specimen taken at the site of esophageal stricture disclosed squamous cell carcinoma, Grade II.

Pathologic Report (C. A. Hellwig, M.D.).—Gross:* The specimen consisted of three hard pieces of grayish red tissue, one 1 mm. and the others between 3 and 4 mm. in diameter. *Microscopic:* The tumor grew in strands originating from the surface. There was marked variation in the size of the nuclei. Some cells were very large and showed keratinization. A few horn pearls were observed.

At bronchoesophagoscopic study on May 18 the peripheral portion of the esophagus was narrowed and contracted by scar tissue. A cauliflower-like carcinomatous growth encircling the esophageal lumen was visualized. Biopsies confirmed the earlier diagnosis of squamous cell carcinoma, Grade II. Bougies were passed to dilate the lumen to the diameter of a No. 40 French catheter. Bronchoscopic study at this time disclosed a healthy orifice of the right upper lobe, from which no purulent material could be aspirated.

A right thoracotomy was performed on June 1. The midesophageal lesion had invaded the mediastinum, the trachea and the pulmonary hilus. Palliative resection of the esophageal lesion with an end-to-end anastomosis was done, a 10-cm. vascular pedicle graft from the transverse colon being used.

COMMENT

Teleky, in 1904, reported a case of carcinoma of the esophagus at the site of stricture, twenty years after the ingestion of lye. In Bigger and Vinson's case the interval between the ingestion of lye and the occurrence of carcinoma was forty-two years. In Henniger's case, reported in 1932, the interval was sixteen years—the shortest on record. In our case the existence of carcinoma was confirmed by biopsy thirty-six years after the ingestion of lye. The carcinomatous change usually occurs between thirty and forty years after lye is ingested. Hardin recently reported a ten-year analysis of 71 patients with acute caustic burns, in which no carcinoma had yet developed. On the other hand, Wurnig, in 1955, reported 7 cases of carcinoma following ingestion of lye. The age at which the accident occurred was between the ages of 2 and 14 years, and the carcinoma developed between the ages of 42 and 62 years.

Fatti and his co-workers, in February 1956, reported the treatment employed in 147 cases of caustic stricture of the esophagus in a period of six years. According to the authors, 99, or 70 per cent, of the patients have been successfully treated by esophageal dilatation. After a follow-up of perhaps forty years, carcinomatous degeneration may be predicted. Biopsies should be done more frequently to assure the endoscopist that he is not treating an

*Pathologist, Hertzler Clinic.

already developed carcinoma by dilating the esophageal lumen!

Not a single case of adenocarcinoma in this connection has been found in the literature. In all cases reported the tumors have been of the squamous cell type, which indicates degeneration of the surface epithelium.

Treatment.—The triad of events after ingestion of a corrosive agent (in the case here reported, lye) is as follows: First, a severe stricture is created, owing to burn and necrosis of the esophageal mucosa. Second, after an interval of years, malignant degeneration develops at the site of the stricture. Finally, the carcinoma invades the trachea or the bronchial tree by direct extension, initiating a bronchoesophageal fistula. To prevent the aforementioned complications, early resection of the esophageal stricture with primary anastomosis is in our opinion the treatment of choice. It cures the stricture, prevents the development of carcinoma and restores to society a healthy, normal person, instead of leaving an "esophageal cripple" whose span of life may be no longer than forty-five years. With the current progress of modern surgery, the mortality rate of segmental esophageal resection for stricture is low; an occasional failure is a small price to pay if one envisions the miserable lives led by those who accidentally ingest caustics at an age when they can barely speak or stand on their own feet!

SUMMARY

1. A case of carcinomatous degeneration of the squamous cell type at the site of lye stricture, thirty-six years after the ingestion of lye, is reported.

2. A triad of complications takes place after ingestion of lye; (a) severe esophageal stricture; (b) carcinomatous degeneration at the site of the stricture, and (c) bronchoesophageal fistula.

3. The treatment of choice is early segmental resection of the esophageal stricture in order to restore the continuity of the esophagus and to prevent development of carcinoma at the stricture site in later years.

ZUSAMMENFASSUNG

1. Es wird über einen Fall krebsiger Degeneration vom Plattenepitheltypus einer Speiseröhrenverengung 36 Jahre nach Verschlucken einer Lauge berichtet.

2. Nach dem Trinken von Lauge tritt eine Trias von Komplikationen auf: a) schwere Verengung der Speiseröhre, b) krebsige Entartung an der Stelle der Striktur und c) Fistelbildung zwischen Speiseröhre und Bronchus.

3. Die Behandlung der Wahl besteht in frühzeitiger Resektion des verengten Speiseröhrenabschnitts, um eine unbehinderte Passage herzustellen und der Entwicklung eines Krebses an der Stelle der Verengung vorzubeugen.

SUMARIO

1. O autor apresenta um caso de degeneração carcinomatosa de tipo de célula escamosa, no local de estreitamento, ocorrendo 36 anos após a ingestão de soda cáustica.

2. Uma tríade de complicações tem lugar após a ingestão de soda cáustica, (a) grave estreitamento esofageal; (b) degeneração carcinomatosa no local do estreitamento, e (c) fístula bronquioesofageal.

3. O tratamento de escolha é a ressecção segmental precoce do estreitamento esofageal afim de restaurar a continuidade do tracto gastrointestinal e impedir o desenvolvimento do carcinoma no local do estreitamento.

RIASSUNTO

1 Viene riferito un caso di carcinoma spinocellulare insorto su una stenosi da caustici 36 anni dopo l'ingestione della soda

2 Tre complicazioni sono possibili: la stenosi serrata dell'esofago, la degenerazione carcinomatosa del punto ristretto e la fistola broncoesofagea

3 La terapia di elezione e rapresentata dalla resezione segmentaria della stenosi allo scopo di ristabilire la continuità del tubo digerente e prevenire le complicazioni

RÉSUMÉ

1 L'auteur presente un cas de degénérescence carcinomateuse (tissu épithelial squameux) située au niveau d'un rétrécissement 36 ans après ingestion d'eau de lessive à base de cendres de bois

2 Une triade de complications suit l'ingestion a) rétrécissement oesophagien grave, b) dégénérescence carcinomateuse au niveau du rétrécissement, c) fistule broncho-oesophagienne

3 Le traitement de choix est la résection segmentaire précoce du rétrécissement afin de restaurer la continuité du tractus gastrointestinal et de prevenir le developpement d'un carcinome au niveau du rétrecissement

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There is an emanation from the heart in genuine hospitality which cannot be described, but is immediately felt and puts the stranger at once at his ease

—*Irving*

In good company you need not ask who is the master of the feast The man who sits in the lowest place, and who is always industrious in helping every one, is certainly the man

—*H*

Editorials

Trends in the Surgical Treatment of Cataract in the Past Fifty Years

THIS article will deal with some few ideas concerning the art of practicing ophthalmology. I am convinced that this is a very important consideration to be kept in mind in dealing with one's patients and is particularly important in one's early practice. I have watched young men with wonderful training in our specialty who have partially ruined the possibility of developing a happy and successful practice simply because they failed to realize that there is a psychic factor that must be put into play in their management of the individual patient. I question whether the average ophthalmologist realizes that the patient who consults him about his vision, or for pain or an injury, or even a refraction, is in deadly earnest, most uneasy and possibly apprehensive throughout the examination, and that he certainly expects the doctor to advise him, in understandable terms, how seriously his eyes are involved, and, if possible, give him a comprehensive prognosis.

It took me several years to awaken to that fact that, even after completing a simple refraction (if there is such a thing) and observing no pathologic change, it is almost criminal to fail to tell the patient that his eyes are healthy and to assure him that you have discovered nothing worth worrying about. It has long been a matter of principle with me to tell my patients the truth about my observations, no matter how serious. I have found that they appreciate knowing exactly what I have observed.

Every patient should have a firm belief in his doctor's ability and complete trust in him as a human being, and this can be obtained only if the ophthalmologist himself stimulates this honest confidence with a combination of good training, common sense, a relaxed attitude, sound judgment and genuine interest in his patients as fellow beings.

Looking back over a half century of practice directed exclusively toward the eye makes one conclude that some of one's early experiences were unbelievable—that they could not really have happened! As one grows mature in practice there comes an inclination to recall past experiences, particularly in surgery, and review the enormous changes that have taken place. One then begins to realize fully how great a number of improvements have been achieved to make one's surgical efforts easier, safer and happier, and to eliminate so many fears and dreads of possible calamitous events.

Looking back over my own five decades of good, bad and indifferent surgical effort, it is easy to bring to mind the dozens of occasions when people were so unfortunate as to have selected me as their surgeon, for they might well have lived happier, more productive lives had I employed good sense and solid judgment.

It is often refreshing to me to admit my

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weaknesses, ashamed as I am of many of them They have caused me sleepless nights and my patients many unhappy days When unfortunate or even disas trous occurrences or complications arise during a surgical procedure, the surgeon should not try to ease his conscience by placing the blame on the patient, the surgical assistant, the nurse, a kibitzer or anyone else conveniently at hand, but should be honest with himself, he should at least accept the blame for his poor judg ment or inept actions, and thereby make it possible for him to live with himself

My first solo cataract extraction was performed in 1905 My patient, a pop eyed man in his sixties, placed himself in my hands for the purpose of having his sight restored after nine years of complete blindness He had summoned all of his intestinal fortitude, as well as that of his wife, four sons and four daughters, be fore deciding that he should undergo such an ordeal This man had little faith in anyone's ability or integrity, and practi cally none in the surgeon he had selected I am sure he had more confidence in me and my ability, however, than I had

Anyway, my preparation for surgical intervention was as follows First, a long lecture to the patient on his behavior dur ing and after the operation Next, a good lively dose of magnesium sulfate was pre scribed, to be taken on Thursday after noon This violent approach started to erupt during the evening hours, which kept my patient dashing back and forth through the night to the outhouse on his farm A high enema was advised for Fri day, and instead of giving comfort to my victim it aggravated his bowel irritation during *that* evening This provoked the patient no end, because he had repeatedly given me to understand that he was and always had been as regular as clockwork with the aid of Little Liver Pills It was my conviction nevertheless, that I had carried out an important preparatory measure He reported to the hospital at 8 a m on Saturday, ready for the ordeal

The upper half of his face was scrubbed with soap and water, making a lather com parable to that depicted on the Friday night fight program on television

The topical anesthesia meant 5 drops of 5 per cent cocaine at five-minute intervals for a total of five doses After a long look and a deep sigh, a conjunctival fixa tion at 6 o'clock and a Graefe (almost un eventful) section was made a two ton speculum being used for exposure of the field Plenty of argyrol had been instilled amounting almost to a marination! This so called antiseptic was squirted away vigorously with a saturated solution of boric acid An iridectomy was done dur ing the section which was intended to be a perfect keyhole but turned out later to re semble a hammock At this point I prayed that there would be no squeezing or or bicular spasm I had intended to employ a serrated capsular forceps to tear away the anterior capsule of the lens, but *some thing* happened — a confusion ensued which I could not analyze—*much* confu sion—you might say that all sphincters present were oscillating! After a gradual return of my powers of accommodation, I came to the bright conclusion that most certainly *something* had happened The pupil was black, no vitreous was in sight, the wound was intact—but where was the cataract?? In the vitreous, was my first thought We looked about here and there and finally, my nurse assistant located it resting peacefully on my gown, directly under my chin We left the lens *in situ* for the moment and clumsily slipped out the two-ton speculum I tried my utmost to gather sufficient courage to separate the lids in order to see if the wound lips were in apposition, but to the clusion that letti

[illegible] e wiser

first valuable lesson I learned in my first solo intracapsular cataract extraction.

At the time of the first dressing on the fourth postoperative day my patient was still squeezing. On the eighth day he permitted a peek at the inferior cul de sac, and finally, on the seventeenth day, I had a glimpse of the lower third of the cornea. On the twentieth day he revealed, with the aid of a few drops of cocaine, a good anterior chamber, a pure black pupil, and a nice keyhole iridectomy (which still looked like a hammock). He had 20/30 vision with correction.

This initial performance was followed by dribble after dribble of successes and failures. Many years passed after that episode before I readopted this intracapsular technic.

After this, I carried on in a bold manner until I reached the point of assuming that cataract extraction had reached the summit and that I could not possibly better my technic. This conclusion, I am sure, was a product of the many aids that have been devised to make this operation a safer, pleasanter procedure, although there still remained an occasional infection or vitreous presentation, by which I mean the gaping fishmouth wound with a vomiting of gel which cannot campare with the rare episodes one now faces semi-occasionally.

I cannot help wondering what it was that encouraged me to continue the pretense that I was an ophthalmic surgeon. Was it a lack of intelligence? Was it stubbornness? Or was it ego? Years passed, and I found that frequent visits to the large clinics throughout the world did not afford me the confidence I had hoped to gain, for I seldom encountered cataract operations, even in skilled hands, that produced end results better than my own. And, believe it or not, there were *some* surgeons who were worse! The well trained ophthalmologist of today, at the end of five years, is better prepared to execute a lens extraction than I was after a quarter of a century of practice, for the simple reason that intense apprehension is not badgering him throughout the operation.

I should like to name and comment on a few of the aids which have become available during the past half century to simplify cataract extraction and produce better end results.

1. Better means of accomplishing a really intelligent general physical examination in order to determine what preparation the patient should undergo before operation is attempted.
2. Reliable sedation.
3. Akinesia. This was a boon — how had the specialty got along without it?
4. Retrobulbar anesthesia, a godsend.
5. Hydase, which in my hands has made opening the globe a safer procedure.
6. Canthotomy. This added materially to the operative field in the small, deep-set eye.
7. Scleral fixation. This solved the fixation problem.
8. The Bridal suture. Among other advantages, this has done away with the exasperating phrase "Look down."
9. Keratome incision and scissors. These have enlarged and simplified section.
10. The capsule forceps for delivery of the lens in its entirety. This is eminently satisfactory. I am thoroughly convinced, however, that I get a greater percentage of successful extracapsular deliveries. Not too long ago, ophthalmological society meetings were infested with arguments, some of them quite heated, as to the advisability of doing intracapsular extractions.
11. The round pupil. I am sure, however, that in many cases a combined extraction is required.
12. Curare. This has proved valuable to a number of surgeons.
13. Abandonment of the speculum.

14. New instruments. Compared with the old, they are wonderful.

15. Cortisone, for postoperative use in chosen cases.

16. Fever therapy for some postoperative complications.

17. Diamox for aphakic glaucoma.

18. Grieshaber needles. These are excellent; they make wound closure simple and efficient.

These advances have given much comfort to the patient as well as to the surgeon and they have developed confidence in the surgeon on the part of the public at large—too much confidence, in fact, so that the public at large has reached the point of considering him well-nigh infallible.

Every step of a cataract procedure is seriously important to the surgeon. Not one is of minor importance.

Incidentally, I am sure that, had the young surgeon of today been compelled to employ the Graefe knife for making a section, his progress in the surgical treatment of cataract would have been retarded and his results, in many instances, most discouraging. For instance, in those days, how would he have handled a decidedly shallow chamber? How would he have managed a complete loss of aqueous after the puncture or counterpuncture? A postponement? This move would certainly have demanded a pretty ingenious explanation to the patient, as well as to his dear relatives and friends.

When it comes to proposing a cataract extraction, the surgeon would find himself performing but few operations, if, preoperatively, he should recite to his prospective patient a complete list of all the unhappy events which have arisen and may occur again during and after his attempts to restore vision.

I can't for the life of me understand why I clung to the hope that some day things would change and my percentages of success would read much better; that I would be relieved of all apprehension; that the vitreous would recede rather than protrude, and that a law would be enacted to do away with postoperative expulsive hemorrhages! I had dreamed of the day when I could approach a cataract extraction boldly and fearlessly with nary a tremor and with no possible hypernervousness to subdue. I must admit that I have never reached that goal. I am not ashamed to confess that I am still somewhat timid on occasion, after my many early unhappy experiences.

The older one grows, the farther away seems the peace one has looked forward to enjoying. Can it be that old-timers grow more timid and discouraged as the years roll on? Or is it that one is consulted by the hopeful blind, who have chosen one as their benefactor? Could it be that a great many of the sufferers convince one that they have the utmost confidence in one's ability to heal them? Such an expression from a patient, young or old, to me is devastating.

One truth I learned many years ago: Regardless of the end result of a cataract extraction, *a cross word, or even a few impatient phrases, aimed at the blind or the partially blind will never be forgotten or forgiven*, while any small kindness or consideration will be forever remembered.

A goodly percentage of surgeons, when they have finished their residencies, emerge all puffed up like a swollen crystalline lens, feeling within themselves that they have little else to learn. In my early years, inwardly, I felt incompetent to a degree, but I must admit that I was saturated with a feeling of importance. In my explanations as to the cause of my patients' dilemmas I used words and phrases that confused me as well as the patient. [illegible] my [illegible]nified attitude, [illegible]nd multisyll[illegible]

tient's ailments were as bewildering to me as to the patient. Professors and their assistants, whom I admired for their knowledge, plus a charity hospital training, were responsible for this idiotic pose. Looking wise, as though I were in deep thought (not puzzled, just in deep thought) was a favorite indulgence, but I soon learned that it was a bad practice. It required some months for me to awaken to the fact that words of one syllable, a relaxed attitude and a natural behavior were the effective approaches. I also learned that it was not a disgrace to employ the phrase "I don't know" in answering some of the questions I was asked.

After practicing ophthalmology for fifty years, a man would indeed be stupid in the extreme if he had not picked up a great number of useful aids in his practice. Every new instrument that has been devised for aid in the management of cataract has upset me terribly, for the simple reason that it provoked me to reflect that I hadn't thought of it myself.

I could not possibly relate to you the number of wise tactics I have learned from time to time—simple procedures, which I should have learned more readily and not through hard experience. In a haphazard sort of way, I should like to name a very few of them:

First, the importance of quiet dignity in the operating room—no talking except by the surgeon to the patient. Second, the value of rubber gloves. The delicacy of my touch must not amount to much. Others speak of extreme digital hypersensitivity whenever gloves are mentioned. I must admit that with gloves on I can't feel the iris twitch during an iridectomy or an iridotomy, but I get on nicely without it. It is my conviction that dressings should be done daily. The word "please" should precede any instruction to the patient. Puzzling problems that may arise during the operation should be carefully thought out beforehand. Detachment of the choroid or prolapse of the iris should be corrected early. Corneal dystrophy, however mild, warrants a guarded prognosis. A postoperative spastic entropion should be corrected the day it is discovered. An excess of barbiturates is conducive to disorientation. As to the correction of an epithelial invasion of the anterior chamber, I would suggest prayer. There should be no hurry about removal of sutures. Arteriosclerosis and high intravascular tension are overemphasized dangers. Early needlings are advisable. The surgeon should be ready for any emergency, including enucleation, and all instruments should be excellent and complete.

I learned many years ago to patch only the eye on which I had operated. In addition, I threw away the sandbags piled on either side of the head, thus insuring the patient many relatively comfortable hours.

I have come to the conclusion that the younger men are not thrilled about their elders' recitals of early difficulties in practice. They know that the height of the hurdles is magnified although some of us will always remember some of these difficulties; for instance, the drugs that were used before the advent of the antibiotics to establish a cure for an infection without a name. There was, first of all, boric acid solution, which was used for anything and everything. Then there was zinc sulfate solution, which was used in cases of angular conjunctivitis; copper sulfate solution or stick, for trachoma; and yellow oxide of mercury for any external condition, particularly dandruff of the lids. And, of course, there was argyrol, which was used for everything else.

In some instances the results were amazingly good. Either that, or the patient couldn't afford the treatments, or grew disgusted and consulted someone else. Even then it is more than possible that his new consultant merely changed

the strength of the argyrol.

One of the most obvious facts I have learned is that, as one's surgical practice grows, so do one's problems. Ophthalmology has no place for either a brilliant or a dashing surgeon. The ideal ophthalmic surgeon should be a cool, calm and calculating person who does not succumb to impulses. He should be a planner and be able to make a careful evaluation of each case as it presents itself, and he should be broad-minded enough to admit to himself and others that he is capable of making mistakes or errors in judgment. In addition to this, it is most important that he develop the ability to judge the character of each individual patient, and an understanding of that all-important doctor-patient relation, which must be maintained in every single phase of his practice.

When I was 50 years old, I was thoroughly convinced that the physician of 70 should be retired with the label of "old fogey." I have changed my mind. One is never too old to learn.

—WATSON GAILEY, M.D., F.I.C.S.
Bloomington, Illinois

The Peptic Ulcer Problem in South India

PEPTIC ulcers of the duodenum and stomach are extremely common in South India and form a considerable part of the work of a general surgeon attached to any of the large hospitals in this area. Certain conclusions, based on experience with approximately 2,500 inpatients in the Government General Hospital of Madras, during the past thirty years, are justified.

The majority of patients were members of the working classes; only a small proportion (about 5 per cent) came from the middle and upper strata of society. Only a small number belonged to the business and professional classes.

The proportion of male to female patients was 20 to 1. The third and fourth decades of life contributed the largest portion of the total—90 per cent.

Since the cause of peptic ulceration is unknown, the high incidence of the disease among the working classes during the active period of their lives may be due, among other causes, to their dietetic habits. The main article of diet among these people is boiled rice eaten with various curries made of vegetables and seasoned with chilli pepper, tamerind and other spices. Large quantities are consumed at each meal, but meat, fish and eggs are eaten rarely, as they are too expensive for the common man. For the same reason, milk and milk products are available to only a few. This diet, however appetizing it may be, is irritating to the stomach and deficient in fats, proteins and vitamins. It is interesting to note, in this connection, that in the northern parts of India, where a wheat diet is preferred and rice forms only a small proportion of the daily intake, peptic ulcers occur much less frequently. The majority of our patients eat only two meals a day—one in the morning and another in the evening; sometimes they get only one meal with nothing in between, so that the stomach remains empty for hours. Smoking of cigarettes, cheroots and "beedies" (a kind of rustic cigarette made of chopped tobacco rolled in leaves and sun-

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dried) is common.

Generally, when they present themselves for treatment at the larger hospitals, these patients have already suffered from their complaints for periods ranging from five to fifteen years. It is unusual to see an early peptic ulcer except among the well-to-do classes. Such complications as pyloric stenosis are common.

Hematemesis and melena are not uncommon, but severe hemorrhage is encountered only rarely. Patients with acute perforations seeking treatment at an early stage are rare, for almost 80 per cent of our patients live in villages, and they are unable to get any treatment there except the medicinal form. Those with mild conditions recover without operation; those seriously affected die without operation. Slight acute perforations that have been temporarily relieved usually turn up several days after the incident, when adhesions to adjoining organs have formed. Patients coming during the first six hours are rare. Usually they report after twenty-four, forty-eight, even seventy-two hours, when the outlook is almost desperate.

The favorite site of duodenal ulcer is the first part of the duodenum, usually on its anterosuperior border and extending backward into the posterior wall, leaving visible anterior scarring. Ulcers on the inferior border have also been observed, as have multiple ulcers in the anterior and posterior aspects, the so-called kissing ulcers. Ulcers in the duodenum are about fifteen times as common as ulcers in the stomach, and in about 5 per cent of cases one sees ulcers in both stomach and duodenum. Stenosis of the duodenum, with considerable dilatation and hypertrophy of the stomach, was a frequent feature of our earlier cases. Latterly, patients come earlier for treatment, before the onset of stenosis or other complications.

The general condition of these patients on arrival is anything but satisfactory. They are generally in an advanced state of malnutrition and often have intercurrent diseases like malaria, tuberculosis and helminthic infections, particularly ankylostomiasis and ascariasis (one often sees these ankylostomes from the jejunum crawling in the wound during the anastomosis, which is generally done without the aid of clamps. Nevertheless, wound sepsis has been rare, and even in the earlier years, before the advent of trained anesthetists and blood transfusion, the patients have tolerated operative treatment extremely well. In recent years, with better anesthesia and routine blood transfusions, mortality has been almost eliminated.

In the earlier years, gastrojejunostomy of the retrocolic, posterior, no-loop, isoperistaltic type was the routine treatment for duodenal ulcer, partial gastrectomy being reserved for ulcers in the lesser curvature of the stomach. One of us (K. G. P.) began to resect the involved organs (stomach and duodenum) for peptic ulcer as early as 1930. This method has since been gradually extended by the younger partner (C. P. V. M.) until, at present, subtotal resection is routine and gastrojejunostomy is done only in "poor risk" cases in which the trouble is of long duration, the ulcer has healed and the problem is that of relieving chronic duodenal obstruction.

The operative technic employed is on standard lines with occasional minor variations. The duodenal ulcer is included in the resection, if practicable, in almost all cases, being left behind only when scarring and induration are so extensive that removal would endanger the bile ducts. When the duodenum is left behind, the section is always made through the duodenum, care being taken to remove all gastric mucosa. Proximally the resection is carried high on the greater curvature, to a point near the splenic hilum. The anastomosis is usually antecolic.

The assessment of the long-term results of these operative procedures has been difficult in this country. Most of our patients are uneducated and unable to reply to letters. There are no follow-up departments in the State Hospitals, so that any impressions formed in these circumstances are based either on immediate results or on later reports given by neighbors or by village practitioners of medicine.

The number of patients in whom anastomotic ulcers develop after gastrojejunostomy has not been great, and, of the few so affected, only a small number were our own patients at the time of the first operation. Thus, out of a total of just over 1,200 cases of peptic ulcer treated during the last fifteen years by one of us (C. P. V. M.), there were only 28 cases of anastomotic ulcer. It is possible that some patients, though they have symptoms, dread a second operation, blame the surgeon for their troubles and do not return to him.

These patients have all been treated by *resection in one stage; the mortality rate* has been negligible and the results satisfactory. No case of anastomotic ulcer after partial gastrectomy has been encountered during the past *fifteen years*. This may be only a coincidence, for the resections are comparatively recent and are done by only a few surgeons, and the resection is wide —about 80 per cent of the stomach.

There have been few cases of the so-called 'dumping syndrome.' A few patients have reported to us with moderate anemia, and they have responded to medical treatment. The reasons we have practiced gastric resection recently more extensively, in spite of the reasonably good results of gastrojejunostomy, are as follows: first, an anastomotic ulcer following gastrojejunostomy necessitates a more difficult surgical operation, and second, in recent years more patients with the nonstenotic type have been subjected to operation, while in the first half of this period about 80 per cent showed signs of stenosis. Of the last 1,200 cases only 420, or about 35 per cent, involved stenosis. In this series 724 patients were treated by gastrojejunostomy, with 25 deaths (a mortality rate of just over 3 per cent) and 438 by partial gastrectomy (including 28 with anastomotic ulcers) with 28 deaths (a mortality rate of about 6.5 per cent). This rate has been considerably reduced in the past few years. In the past two years there has been only 1 death in more than 100 cases. The mortality rate for acute perforations has been above 30 per cent. Almost all have been treated by simple closure, with or without drainage. This high mortality rate is attributable to the late stage at which the patients presented themselves for treatment.

Vagotomy has not been performed to any appreciable extent. The distention of the stomach that follows this procedure has been troublesome, and the results have not justified its adoption in preference to gastric resection.

We have endeavored to present, on broad lines and without going into detail, the main features of peptic ulcers as they are encountered in Madras, and have outlined the general lines of treatment adopted. It is the poorer classes that are most affected by this disease, and, whatever may be the basic cause, improvement in their economic condition and habits of life, it is hoped, will materially reduce the incidence of this disease, which occurs during the active years and impairs efficiency.

Malignant diseases of the stomach are frequently encountered, but more than 90 per cent of the patients come too late for removal of the growth or, indeed, for help of any kind.

—K. G. PANDALAI
Lt. Col. I.M.S. (Ret'd),
M.B., F.R.C.S., F.I.C.S., and
—C. P. V.
M.S., F.

Abstracts from Current Literature

Report of Surgical Repair in the First Group of Atomic Radiation Injuries. Brown, J. B., and Fryer, M. P., Surg., Gynec. & Obst. 1:1, 1956.

Report is made of the surgical repair of the first known group of atomic radiation injuries (without thermal injury). No amputations have been necessary, and all patients are back at full-time occupations.

These were injuries caused by pure atomic radiation and are not thermal injuries of atomic origin like those described elsewhere. If such patients do survive, it seems proved herein that local injuries caused by atomic radiation may be repaired surgically and that successful rehabilitation is possible.

WILLIAM E. NORTH, M.D.

Induction-Delivery Interval Following Artificial Rupture of the Membranes. Manly, G. A. Lancet, 2:227, 1956.

In order to gain a clearer understanding of the noninitiation of labor after artificial rupture of the membranes, the author has studied 500 consecutive cases of such rupture.

Irrespective of the condition of the cervix, of the indication, of the presentation and of the quality and quantity of liquid removed, 77 to 90 per cent of women will be delivered within seventy-two hours of artificial rupture of the membranes.

There is no cause for alarm if labor has not ensued within three days. If the uterus becomes firmly wrapped around the baby without labor pains, however, active intervention is urgently indicated.

Prolapse of the cord was observed in only 1 case of head presentation, when labor was well advanced, and a vaginal delivery was successful.

In these 500 cases there were 49 forceps extractions and 31 cesarean sections, 11 of which were performed on patients with closed cervixes. Nine of these had no labor at all.

In 48 cases labor had not ended three days after rupture of the membranes. In 28 of these delivery was subsequently normal, the longest interval being eleven days. All patients were given chemotherapy after forty-eight hours, and none suffered any serious ill effects.

In the 500 cases reviewed there were 2 maternal deaths and 21 stillbirths. Manly expressed the opinion that rupture of the membranes did not contribute to either maternal death. Of the stillbirths, 15 were unrelated to rupture of the membranes, while in the 6 remaining cases death may have been precipitated by that intervention.

THOMAS WILENSKY, M.D.

Late Results in the Surgical Treatment of Duodenal Ulcer. Priestley, J. B., J. Iowa State 6:239, 1956.

This concise report represents one surgeon's experience with 77 private patients with duodenal ulcer, in whose cases conservative gastric resection with gastrojejunostomy was selected as the treatment of choice.

The resection was often performed at the pylorus, no attempt being made to remove the ulcer except in the presence of acute bleeding and a few other "extraordinary" lesions. The anastomoses were mainly anterior and utilized the entire gastric transection.

Priestley expresses the strong conviction that excessive removal of the stomach (more than 60 to 65 per cent) is unnecessary and that the incidences of poor functional results, anemia and loss of weight are greatly increased when this is done.

The vagus nerves were not disturbed in any of these cases, nor was enteroanastomosis employed in any instance.

The 2 hospital deaths were caused by pulmonary embolism and atelectasis. More than

half of the patients had bled at some time before the operation

The statistical data presented were collected by questionnaires sent to each patient All but 3 patients reported 75 per cent relief or more; 53 reported 90 per cent or more and 38 had obtained 100 per cent relief

Dumping appeared minimally and infrequently

The operations were all performed between 1946 and 1954, with approximately equal numbers in each year Only 2 patients reported taking medicine regularly for their stomachs Ninety-five per cent reported that if they had it to do over again they would submit to the operation

Since it is virtually certain that no one operation represents the best procedure for all ulcers, Priestley is convinced that a rather conservative partial gastrectomy with gastrojejunostomy is still a valuable method of treatment in selected cases of duodenal ulcer

THOMAS WILENSKY, M D

Artificial Sponges in Surgery William, B, Lancet 1:779, 1956

For some time the author has been using artificial sponges in obstetric and gynecologic practice, especially in cesarean sections

The sponges are made of wool pulp by the viscose process and carry the trade name 'Spontex" When moistened they are soft, and they are highly absorbent They can be easily washed after use and can tolerate repeated autoclaving The material can be cut easily when dry, and various sizes are used The most convenient size is about 3½ by 2½ by 1½ inches

A great advantage of using these sponges lies in the resulting simplification of the sponge count

EDMUND LISSACK, M D

Hepatic Venography. Tori, G, Scientifica Medica Italica 4.304, 1956

Finely detailed diagnostic information is often imperative for correct treatment It is now possible to selectively visualize single areas of the bronchial tree selectively, or to perform selective angiocardiographic examination, which makes possible a detailed study of any particular portion of the cardiovascular system In order to expand the diagnostic methods available, the author presents a method for hepatic venographic study, one of the possible applications of "selective angiocardiography" that can be realized by instrumental means

The hepatic veins have occasionally been visualized in the course of angiocardiographic examination, especially in children This is brought about when a certain amount of contrast medium is regurgitated from the right auricle during the auricular systole or diastole, passes into the inferior vena cava which thus becomes more or less extensively opacified, and thence into the hepatic veins Systolic backflow is usually encountered in cases of congenital heart disease involving right auricular overstrain Diastolic backflow, on the other hand, may occur in a healthy heart as well as in a heart congenitally diseased, and may result from overfilling of the right auricle with a contrast medium

The technic employed is essentially the same as that used when the heart is catheterized It involves the introduction of No 9 to 12 Cournand catheters into the right or the left basilic vein Under fluoroscopic control, the tip of the catheter is passed by the right auricle into the inferior vena cava The catheter is driven along the inferior vena cava for about 2 to 3 cm, after which it may be rotated either to the right or to the left and is assumed to have approached the orifices of the hepatic veins The catheter is then advanced into the larger hepatic veins It is possible to pass the catheter a much greater distance in the larger right hepatic venous trunks—almost reaching the peripheral parenchymal areas of the liver—than is possible in the left hepatic veins

When the catheter has, under fluoroscopic observation, reached the area of the hepatic venous system to be examined, 15 to 20 cc of a highly concentrated (70 per cent) solution of the iodinated contra
quickly injected Just prior to t
of the injection a first expo
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roentgenograms soon after the injection has been completed, in order to obtain information as to the mode of distribution of the contrast medium.

The patient may either lie supine or remain upright. There are no specific contraindications, except, of course, such general hazards as are to be considered whenever procedures involving the introduction of an iodinated contrast medium into the blood stream are used—hypersensitiveness to iodine, an allergic diathesis, hepatic or renal insufficiency, hyperthyroidism or cardiocirculatory failure.

Another technic involves temporary occlusion of the inferior vena cava by means of a small rubber balloon placed a few centimeters below the opening of the hepatic veins, introduced through one of the femoral veins. The contrast medium is then injected through a second catheter below the level of the balloon, which is introduced through the same or the opposite vein. It is possible to combine angiographic study with measurement of intrahepatic venous pressure, a determination likely to have great value in the diagnosis of a number of diseases, notably those involving either extrahepatic or intrahepatic obstruction.

HENRY J. ROSEVEAR, M.D.

Vagotomy for Chronic Peptic Ulcer: A Five-Year Follow Up. Slaney, G., Bevan, P. G., and Brooke, B. N., Lancet 2:221, 1956.

From 1947 to 1949, vagal section for chronic peptic ulceration was performed on 91 patients by the surgeons of the surgical professorial unit at the Queen Elizabeth Hospital. The presence of the ulceration was proved in each case by barium meal, examination, gastroscopic study or the observations at operation, or by a combination of these methods. All the patients were followed up to the time of writing, and the results are analyzed after five years in order to assess the value of vagotomy in the treatment of chronic peptic ulceration.

After the exclusion of 4 deaths not associated with ulceration, 1 operative death and 1 patient lost to follow-up, recurrences developed in 24 patients, 2 of whom died. This is a recurrence rate of 28.2 per cent. Sixty-five patients had undergone no drainage procedure at the time of vagal section and no previous gastric operation. Recurrences developed in 18 of these patients, representing a recurrence rate of 27.7 per cent for vagotomy as the sole treatment of peptic ulcer. The recurrences appeared to be unaffected by the existence or nonexistence of gastroenterostomy, pyloroplasty or partial gastrectomy done either before or coincidentally with vagotomy. The rate of recurrence increased with passage of time, for further recurrences have been observed since the end of the five-year period.

If it is true that after vagal section it is impossible to stimulate the secretion of acid by means of an adequate degree of hypoglycemia, either nerve section was inadequate in many cases or else the nerves had regenerated. It was immaterial whether section was made through the thorax or through the abdomen. No correlation was observed between the failure to reduce acidity and the recurrence of ulceration.

In 6 patients who had previously had duodenal ulcers, gastric ulcers developed. This is difficult to explain, as in no case did serious gastric stasis arise. One death took place as a result of gastric carcinoma in a man who had had a duodenal ulcer.

The criteria of healing are entirely clinical, because scarring may remain to present roentgen evidence of duodenal deformity at all times. The results of the various tests of gastric acidity are too variable on different occasions in the same case to make comparison easy and are thus robbed of meaning; exact clinical correlation appears to be impossible.

HENRY J. ROSEVEAR, M.D.

Treatment of Chronic Duodenal Ulcer by Antroduodenectomy and X-Irradiation. Brown, G., and Wood., I. J., Lancet, 2:169, 1956.

This is an interim report on 142 patients with duodenal ulcer treated since 1951 by surgical removal of the ulcer with conservative gastroduodenal resection ("antroduodenectomy"), followed in 52 instances by roentgen irradiation of the remaining portion of stomach to reduce the secretion of acid and

pepsin and thus lessen the risk of recurrent ulcer.

Antroduodenectomy, a conservative Billroth I operation, was adopted in an effort to prevent the well-recognized undesirable sequelae of subtotal gastrectomy with gastrojejunostomy.

The 52 patients who were given postoperative roentgen irradiation have been followed for an average period of thirty-one months.

The irradiation was administered two months after the operation, a total gastric tissue dose of 2,000 r. being given in three weeks after careful location of the stomach by barium meal examination.

Of 100 patients followed for twelve to fifty months, 52 underwent antroduodenectomy and roentgen irradiation and 48 were subjected to antroduodenectomy only. In each group there were 6 recurrent ulcerations. Although the reported figures suggest that the roentgen irradiation did not reduce the incidence of recurrence, it may well have delayed the onset of symptoms, as the average time of recurrence was twenty-five months after the operation in those treated by irradiation and twelve months after the operation in the group not so treated.

Although there were 3 immediate postoperative deaths (2.1 per cent) and an ulcer recurrent rate of 12 per cent, the authors express the opinion that the excellent results in the patients whose progress was classified as "very good" (83 per cent) justifies further efforts to employ and improve this combined method of treatment.

THOMAS WILENSKY, M.D.

The Functioning Carcinoid Tumor, A New Clinical Entity: Review of the Clinical Features of the Nonfunctioning and Functioning Carcinoid, Including a Review of Thirty-eight Cases from the Literature. Mattingly, T. W., M. Ann. District of Columbia 25:239, 1956.

This tumor, which is officially listed in American literature as argentaffinoma but is better known by the original term of "carcinoid," has been known since 1888. The pathologic and clinical concept has changed very little, except that case reports and periodic reviews of the literature indicate an appreciation of the increased incidence of metastases, which at times have become widespread and voluminous despite the small and innocent appearance of the primary tumor. It is noted that lesions occurring in the ileum show a higher degree of invasiveness, even causing death from complications. It is now accepted that all carcinoids are potentially malignant.

In 1953, 5-hydroxytryptamine was isolated from carcinoid tumors. This substance was a vasoactive material called enteramine or serotonin. It is pharmacologically active on smooth muscles, producing intestinal peristalsis, bronchoconstriction, varying effects on the blood vessels and lesions of the cardiac valves. The patients with abnormal amounts of serotonin in their blood excrete, in their urine, abnormal amounts of 5-hydroxyindoleacetic acid, which is a recognized breakdown product of 5-hydroxyptamine in the body.

Carcinoid tumors are observed in about 0.2 to 0.5 per cent of appendixes removed surgically. The number observed in the appendix constitutes about 80 to 90 per cent of all carcinoids reported.

The primary carcinoid tumor is small and multiple in 25 to 28 per cent of the cases. It is usually submucosal and rarely exceeds 1 to 2 cm. in diameter. It projects as a small raised nodule in the lumen of the bowel and is hard to palpation. If the lesion is benign there is, at most, a slight puckering of the bowel overlying the tumor. Upon section, the nodule is yellow and firm.

In general, the lowest incidence of invasiveness occurs in the appendix, rectum and stomach, with the highest incidence in the small intestine and the next highest in the cecum and colon. Of surgical specimens resected from the ileum, metastasis was reported in 75 per cent or more. In tumors classified as malignant, the malignant features consisted of extension through the intestinal wall and spread into the regional lymph nodes and mesentery, [illegible] one-third showing metastases [illegible] pancreatic, [illegible] pelvic [illegible] toneal areas,

distant areas. When metastasis does spread to the liver and other organs, the volume of tumor tissue in the site of metastasis may reach several thousand grams and may result in easily recognizable hepatomegaly or in palpable abdominal masses. Ordinarily, patients tolerate these metastatic lesions well and live for years.

In the early state, as has been pointed out, this type of tumor is small and submucosal. As extension progresses into the muscularis and serosa, growth of supportive fibrous tissue produces contracture of the intestine at the site. This may cause angulation of the bowel and adhesions and may result in partial or complete intestinal obstruction. As the tumor infiltrates and extends into the regional lymph nodes, there are increasing opportunities to produce obstructive symptoms. Occasionally some of the larger metastatic lesions undergo cystic degeneration.

Symptoms of nonfunctioning carcinoid depend upon the site of the primary lesion. The size of the primary tumor is rarely a factor except in the appendix, the lumen of which is small and is easily obstructed by a small tumor. Carcinoids of the appendix are more frequent in the female than in the male, whereas similar lesions of the small bowel are more common in the male and tend to occur most frequently after the age of 50. There are no distinctive symptoms indicating metastatic lesions from carcinoids of the appendix.

Carcinoids of the stomach and rectum also fail to produce distinctive symptoms. Carcinoids of the cecum and colon are asymptomatic until they extend through the bowel and to the mesentery and the regional lymph nodes, after which the symptoms mimic those of carcinoma, except that there is generally no anemia or melena. The symptoms encountered are obstruction of the lower part of the intestine, diarrhea and loss of weight.

Carcinoids of the duodenum are symptomatic, but the symptoms are not specific or distinctive; carcinoids of the jejunum are rarely symptomatic. Symptoms produced by carcinoids of the ileum are the result of intestinal obstruction caused by the mechanical effects of an unusually large benign submucosal ileal carcinoid. They consist chiefly of intermittent abdominal pain, distress, bloating and distention, recognizable bouts of intermittent small bowel obstruction, intermittent diarrhea and loss of weight. The simultaneous occurrence of peptic ulcers and carcinoids elsewhere in the intestinal tract is frequent and may be more than coincidental. It has been suggested that acute knuckling and kinking of the small bowel, with a filling defect at the site of obstruction, indicates ileal carcinoids.

In general, nothing distinctive can be noted in the abdominal examination except the absence of symptoms indicating rapid growth, necrosis and anemia. The appearance of well-being associated with a recognized, slowly growing metastatic lesion in the liver or the right lower abdominal quadrant might cause one to suspect the presence of a metastatic malignant carcinoid. In addition, functioning carcinoid tumors present symptoms of intestinal hyperperistalsis (diarrhea), loss of weight, cutaneous flushing and some cardiac symptoms or abnormal cardiovascular signs. The most common cardiac lesion observed is stenosis of the pulmonary valve. In many recent cases of functioning carcinoid tumor the results of clinical tests are abnormal, indicating an excessive production of serotonin.

The author has tabulated the autopsy observations in 21 cases of metastatic carcinoid with clinical or functioning tumor, including lesions of the right side of the heart, and 8 cases of malignant carcinoid with clinical features indicating tumors but without autopsy evidence of cardiac lesions. He has also tabulated the data in 9 cases of functioning carcinoid in living patients.

HENRY J. ROSEVEAR, M.D.

L'incarcération du grêle dans l'hiatus rétro-anastomotique après gastrectomie transmésocolique (Incarceration of the Small Bowel in the Retro-Anastomotic Hiatus after Transmesocolic Gastrectomy). Massé, C., and Fauvette, M., Bordeaux chir. 2:74, 1956.

After partial gastrectomy with retrocolic gastrojejunostomy according to the usual technics, a hiatus persists behind the anas-

tomosis, between the transverse portion of the mesocolon and the angle of Treitz This ring often admits 2 fingers, and it is readily conceivable that the small bowel should sometimes enter this hiatus Such an accident is less frequent now than it was during the era of gastrojejunostomy, but it is not rare

Although they would be considered *a priori* possible causes, the type of gastrectomy, the size of the stoma, the direction of the anastomosis and the length of the loop do not seem to play the important rôle The hernia is not always due to a technical fault as such and should, perhaps, be regarded as another possible complication of routine gastrectomy

Twenty-eight cases are studied from the anatomic, operative and clinical aspects It is difficult to draw final conclusions, and the explanations are mostly theoretical Out of this study emerges the golden rule of abdominal surgery "Never create openings capable of giving internal hernias"

S A GUEUKDJIAN, M D

Results of Arterectomy (Résultats de l'arterectomie). Soltesz L, Lyon chir 51 273, 1956

As long as the wall of an artery is intact, the equilibrium of constriction-dilation corresponds to normal circulatory requirements The moment the wall is damaged, the equilibrium is disrupted and the artery not only becomes an inadequate vessel but acts as "a sympathetic nerve in a state of pathologic irritation," holding the collateral network in a reflex spasm Resection of an affected segment of artery (arterectomy) is therefore an operation aiming at the sympathetic, the purpose being to eliminate the nocive impulses emitted from the pathologic arterial wall and to permit the collaterals to do their work There is no plastic reconstruction after arterectomy

The operation is indicated for patients who do not respond to medical treatment, whose general condition is satisfactory and in whose cases there exists the possibility that the collateral vessels may be dilated This is tested by lumbar sympathetic block The operation is of no avail if the condition is in an advanced stage, with such degenerative signs as, for example, trophic lesions

Ten patients in this series were checked periodically for clinical and roentgen evaluation more than a year after the operation It was noted that after arterectomy the circulation of the diseased femoral system was taken up successfully by the healthier and dilated deep femoral artery, together with a rich collateral network In addition to this improvement, arterectomy made the circulation more responsive to further medical treatment

Interesting arteriograms are included There is no bibliography

S A GUEUKDJIAN, M D

Bilateral Adrenalectomy with Special Reference to Operative Technic and Postoperative Complications Franksson, C, and Hellstrom, J, Acta chir Scand 3·54, 1956

The authors discuss the operative technic and the postoperative complications of adrenalectomy on the basis of their experience in 116 cases

The adrenal glands are located retroperitoneally in fatty tissues between the diaphragm and the kidneys The size of each gland varies, and aberrant adrenal tissue is present in 30 per cent of the cases The right adrenal gland is usually placed higher than the left A lumbar approach, with the patient prone, was used in most of the cases in this series

The incision is made over the lower border of the twelfth rib and curved upward, paralleling the midline The twelfth rib is removed, and usually a segment of the eleventh rib as well Great care must be taken to avoid injuring the vena cava

In cases of advanced tumor and cases in which the patient is in poor general condition, 100 mg of cortisone is administered daily for eight or ten days prior to the operation Substitution therapy consists of the administration of 150 mg of cortisone acetate intramuscularly one hour before the operation, 50 mg every four hours on the day of operation 50 mg every six hours on

the first postoperative day and 50 mg. every twelve hours on the second postoperative day. Subsequent doses are reduced so as to reach, within one week, an adequate maintenance dose of cortisone given by mouth, which amount to 50 or 75 mg. daily. Diuresis, increased weight, a moon-shaped face and elevated blood pressure suggest overdosage of cortisone. Hyperthermis occurs in the presence of acute corticosteroid deficiency.

There were 4 deaths in this series. The low mortality rate of bilateral adrenalectomy even for "poor risks" justifies use of the procedure, since substitution therapy is effective.

ERNEST G. DE BAKEY, M.D.

Ulcer-Cancer of the Stomach. Olsson, O., and Endreson, R., Acta chir. Scand. 3:16, 1956.

The author studied 464 cases of gastric carcinoma, treated in a uniform manner, to evaluate the prognosis. Billroth I or II resection with removal of the greater and lesser omentum was done in 176 cases; total gastrectomy, in 25; exploratory laparotomy, in 112, and palliative operations in 39. In 112 the patients were clinically inoperable.

The age range was from 40 to 75 years. Patients in the younger age groups were more often operable than their elders. Early operation offered a better prognosis than did delayed operation. Forty-two per cent of the patients without visible metastases survived for three or more years, while only 6 per cent of those with visible metastases lived as long as three years. A plea is made for early diagnosis and immediate operation.

ERNEST G. DE BAKEY, M.D.

Unintentional Gastro-Ileostomy After Partial Gastrectomy. Brine, J. A. S., and Fraser, T. R. C., Lancet 2:337, 1956.

The author reports a case of gastric resection with gastroileal anastomosis in a patient with abnormal rotation of the intestine. This error in technic leads to a rapid progressive downhill course and possible death. The classic symptoms are severe diarrhea and loss of weight in spite of a voracious appetite. Osteomalacia, anemia and hypoproteinemia also occur. The diagnosis is established by Miller-Abbott tube intubation with instillation of barium.

The reported cases emphasize the importance of a surgeon's being certain that the jejunum is used for the anastomosis. If the error is made the surgeon should be aware of its sequelae and take immediate steps to correct it.

ERNEST G. DE BAKEY, M.D.

Nature, it is true, still sees to it that we are mortal, but with the progress in medicine it will become more and more common for people to live until they have had their fill of life. We are supposed to wish to live forever and to look forward to the unending joys of heaven, of which, by miracle, the monotony will never grow stale. But in fact, if you question any candid person who is no longer young, he is very likely to tell you that, having tasted life in this world, he has no wish to begin again as a "new boy" in another. For the future, therefore, it may be taken that much the most important evils that mankind have to consider are those which they inflict upon each other through stupidity or malevolence or both.

—Russell

New Books

Books Received.—The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

Kurze Heschichte der Vestibularisforschung (A Short History of Vestibular Research). By Ernst Wodak. Stuttgart: Georg Thieme Verlag, 1956. New York: Intercontinental Medical Book Corporation, 1956 (for United States and Canada).

Ulcers of the Legs. By P. Piulachs. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 573, with 303 illustrations. *Reviewed in this issue.*

The Recovery Room. By Sadove and Cross. Philadelphia: W. B. Saunders Company, 1956. Pp. 597, with 103 illustrations. *Reviewed in this issue.*

The Postural Complex: Observations as to Cause, Diagnosis and Treatment. By Laurence Jones. Springfield, Ill.: Charles C Thomas, Publisher, 1956. *Reviewed in this issue.*

Traite de Technique Chirurgicale, Tome V. By B. Fey, P. Macquot, J. Quenu, P. Truffert, M. David, M. Iselin, R. Dosset, R. Dubau, C. Dubost, J. J. Galey, Y. Longuet, J. Loygue, J. Mathey, R. Palmer, J. Perrotin, J. C. Rudler, G. Thomeret and J. Varangot. Paris: Masson et Cie, 1956. 2d ed. Pp. 780, with 781 illustrations. *Reviewed in this issue.*

Urology and Industry. By Leonard P. Wershub. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 130, with 20 pages of bibliography and index.

Clinical Urology for General Practice. By Justin J. Cordonnier. St. Louis: The C. V. Mosby Company, 1956. Pp. 252, with 47 illustrations.

1. **Internal Secretions of the Pancreas.** By the Editors of the Ciba Foundation. Pp. 292, with 100 illustrations. II. **Ageing in Transient Tissues.** By the same. Pp. 263, with 96 illustrations. Boston: Little, Brown & Company, 1956.

Integrated Gynecology: Principles and Practice. By I. C. Rubin and Josef Novak. New York, Toronto and London: The Blakiston Division, McGraw-Hill Book Company, 1956. In 3 volumes. Illustrated. *Reviewed in this issue.*

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 374, with 145 illustrations.

Tumors of the Skin. By Herbert Conway. Springfield, Ill. Charles C Thomas, Publisher, 1956. Pp. 267, with 178 illustrations, 3 in color.

The Biologic Effects of Tobacco. By Ernest L. Wynder, with a foreword by Joseph Garland. Boston and Toronto: Little, Brown & Company, 1956. Pp. 215. *Reviewed in this issue.*

Supplement 1, Atlas of Exfoliative Cytology. By George N. Papanicolaou. Cambridge, Mass.: Harvard University Press, 1956. Loose-leaf format, published for The Commonwealth Fund.

Handbook of Shestack. New Y. Company,

Ulcers of the Legs. By P. Piulachs. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 573, with 303 illustrations.

This complete review of the causes, the pathologic picture and the treatment of ulcers of the leg is timely. All those interested in this field know how often the treatment of ulcers fails because their basic cause is not determined prior to the institution of therapy.

Prof. Piulachs has written on this subject extensively in the past, so that he can quote from over one hundred of his own publications. A volume written by the same author in 1950, *Ulcers de las Extremidades Inferiores de Origen Vascular,* was one of the first books to correlate the pathologic picture with the clinical signs.

Prof. Piulachs dedicates his book "To Professor Matas, M.D., teacher of several generations of surgeons, and to whom present knowledge of vascular is so much indebted." This well-earned dedication is followed by an introduction by Dr. Matas.

The contents of the book are divided into seven sections, beginning with general conceptions, and followed by divisions on ulcers of venous origin, the physiopathologic nature of ulcers due to venous insufficiency, the new pathogenetic concept of varicosities, the evolution of venous thrombosis and its sequelae; arterial ulcers and trophoneurotic ulcers. Each of these sections is illustrated by excellent photographs and photomicrographs. The pathologic picture is further represented by schematic drawings.

This reviewer was pleased to note the care taken to differentiate arterial from venous ulcers. The point would appear to be obvious, and yet many serious errors are made by failure to determine the arterial supply prior to the treatment of ulcers. The utilization of venograms to show valvular incompetence and venous obstruction is advocated and well shown.

Some points are controversial, such as the author's advocacy of ligations of the popliteal and superficial femoral veins, and most American surgeons would disagree with him as to this. In general, however, the book is well written and illustrated, and the binding and printing are excellent. It is recommended as an excellent reference book for the general surgeon, and it will have particular value to the doctor who sees an occasional ulcer.

GERALD H. PRATT, M.D.

Handbook of Physical Therapy. By Robert Shestack. New York: Springer Publishing Company, Inc., 1956. Pp. 212.

The author of this manual, who has had long and exhaustive experience in physical therapy, has undertaken to condense his knowledge and that of others into a practical, convenient and yet comprehensive guide for daily use. In this he has been eminently successful.

There are two main sections in the book, one on the currently available methods of physical therapy and the other on the wide range of pathologic conditions in the treatment of which these methods have proved useful. There is also a brief history of the progress of physical therapy from its origin to the present, which is of great interest to the connoisseur of the whole expanse of medical history.

The manual covers the whole field of electrical physical therapy, including radiant heat, infrared irradiation, diathermy, ultrasonics, ultraviolet irradiation, the use of galvanic current and of low frequency currents and electrodiagnosis. Such other methods as hydrotherapy, paraffin baths, massage and planned exercise are also well covered.

Among the conditions for which treatment is greatly aided by physical therapy the author lists arthritis, rheumatism, peripheral nervous and vascular conditions, acute injuries of the joints, fractures, burns, orthopedic disorders, genitourinary disease and some dermatologic conditions.

The writing is lucid and concise, and the manual is well organized throughout, with an excellent index.

M. T.

The Postural Complex By Laurence Jones Springfield, Ill Charles C Thomas, Publisher, 1956

Medical students and physicians in practice are all too often so completely absorbed in treating the abnormal that they have little time for thought or consideration of a problem that should be equally important to them, i e, preservation of the normal by the prevention of deformities and mechanical derangements that may occur as a result of chronic malposture

Dr Laurence Jones, Chief Orthopedist of the Menorah Hospital, Kansas City, Missouri, and Visiting Orthopedist of Cedars of Lebanon Hospital at various phases of his career, has long been interested in a study of posture and its importance in health and in disease Exhibits on "The Postural Complex,' prepared and presented by Dr Jones at the conventions of the American Medical Association from 1946 to 1951, interested many thousands of physicians

Dr Jones has been particularly interested in devising better methods for the relief of localized foot pain The theory he propounds is in sharp contradiction to that of many others who have had experience along the same line The methods devised and used successfully by Dr Jones are also acclaimed as effective in helping to relieve low back pain with or without sciatica, and in this text an effort is made not only to explain the theory upon which the treatment is based but to suggest a logical conclusion with regard to why simple corrections of the shoe can have so much beneficial effect upon other parts of the body The book will be of interest to those who are aware of this problem, of mechanical and functional derangements as the result of chronic malposture, and particularly of the role the feet play in these conditions

EDWARD L COMPERE, M D

The Recovery Room By Sadove and Cross Philadelphia The W B Saunders Company, 1956 Pp 597, with 103 illustrations

This book deals with the organization and function of the recovery room Basic principles of postoperative care, orders for the specific specialties, and care of complications make up most of the text The book includes outstanding chapters on the principles of the recovery room, the management of circulation, shock, respiration, nutrition and nursing care in the recovery room The authors begin with the preliminary plans and proceed logically with the formulation of policies arrangement of physical facilities and layouts for various types of recovery room units They have carefully covered every aspect of the subject, discussed the pros and cons of each and summarized their opinions as to the advantages of the recovery room on the basis of their experience and observations

This book would be a valuable addition to the library of any surgeon, and should be included in that of every hospital The work crystallizes the experiences of authorities as well as the authors' own, transforming the result into a practical step by step routine of postoperative management of surgical conditions from operations on the scalp to orthopedic surgical treatment of the foot It is a fine work and deserves the utmost praise

JEROME J MOSES, M D

Traite de Technique Chirurgicale, Tome V By B Fey, P Macquot, J Quenu, P Truffert M David, M Iselin, R Dossot, R Dubau, C Dubost, J J Galey, Y Longuet, J Loygue, J Mathey, R Palmer, J Perrotin, J C Rudler, G Thomeret, and J Varangot Paris Masson et Cie, 1956 2d ed Pp 780, with 781 illustrations

This work is No 5 of a series of eight volumes published under the title *"Treatise on Surgical Technique"* The series covers the entire field of operative technic and is edited in collaboration with outstanding personages in contemporary French surgery

Volume 5 deals with (a) operative gynecology (Mocquot, Rudler and Palmer), (b) cesarean section (Varangot), and (c) surgery of the breast (Mocquot and Lonquet) By far the most space (592 pages of the total 780) is devoted to gynecologic surgery with the title, comment on the surgic picture and the ind ns for

is minimal. On the other hand, this section is a veritable encyclopedia of operative technic.

It is interesting to note that the section is developed in two main divisions: operations on the female organs by the abdominal route (231 pages), and operations in the same field by the vaginal route (350 pages). Emphasis is placed upon the widening surgical frontiers achieved since the advent of antibiotics, newer and safer methods of anesthesia and reduction of the dangers of anoxia, shock, hemorrhage and thrombosis. Accordingly, considerable space is devoted to ultraradical operations for pelvic cancer, due credit being given to American surgeons who have pioneered in the field—Brunschwig, Meigs and others.

Those interested in a study of the large variety of corrective procedures for malformations and displacements of the uterus will find herein a wealth of information. The pros and cons of the abdominal and the vaginal route are discussed in great detail. More than average stress is laid by the authors upon the vaginal approach in pelvic operations.

Thirty-two pages comprise a chapter by M. Varangot on cesarean operations. The classic varieties of these interventions are described. Reference is made to the Portes operation, i.e., temporary exteriorization of the uterus in performing a cesarean delivery. This operation is now practically obselete.

The choice of an anesthetic for cesarean section is discussed. Spinal anesthesia seems to be preferred by the French obstetricians. Ideally, local anesthesia, according to the authors, is best, on account of its innocuousness, but in their opinion its use is not always practicable even in the hands of the most experienced. Intravenous pentothal has advantages under favorable technical conditions, that is, when the operation can be done in five to eight minutes. It is safer for use after delivery of the baby. For inhalation anesthesia, when employed, the choice of the authors is cyclopropane. Half a page is devoted to "reanimation" of the newborn by standard methods and principles.

Surgical treatment of the breast (143 pp.) is taken up under the following topics: (a) surgical treatment of mammary infections; (b) operative technics for benign growths and dystrophies; (c) radical mastectomies, and (d) plastic operations on the breast. The technic of mastectomy for cancer is discussed under two classifications: operations without exeresis of the tributary lymphatic systems, and operations with more or less extensive ablation of the related lymph gland areas, together with the pectoral muscles (referred to respectively in English surgical parlance as "simple" (or "local") and "radical" mastectomy).

The basic procedures in the treatment of mammary cancer are credited explicitly to the classic Halsted operation. This, notwithstanding a sentence on page 683 that reads "However, the Halsted operation is evidently illogical since in principle it deliberately neglects the removal of the supraclavicular and internal mammary glands." Nevertheless, subsequent paragraphs modify the impression given in the preceding statement that all radical mastectomies must include the latter procedures. The authors say, further, "It is then theoretically legitimate to extend the dissection of these lymphatic territories." These procedures materially increase the duration and hazard of the operation. Advances in supportive measures, however, have made more extensive dissections feasible when they are obviously indicated.

Several modifications of the Halsted operation are detailed. The work of Urban and his collaborators at the Memorial Hospital for Cancer in New York (ultraradical mammary operations) is not mentioned. One gleans the impression that current surgical practice in France is not widely different from that in the United States. This section on mastectomy reflects a thorough familiarity with the enormous literature on the subject as well as extensive experience. Flexibility and individualization are counseled in arriving at the choice of operation in each case. The extent of operation for malignant disease of the breast ranges from one extreme—local mastectomy supplemented with radiotherapy and hormonotherapy —to the other—the classic Halsted operation, to which may be added removal of Handley's triangle, the internal mammary chain of lymphatics and the supraclavicular nodes. Although the choice of an incision is not to be considered a dominant feature in radical re-

sections of the breast, it is interesting to note that the authors discuss only four or five variants, in contrast to the twelve or fifteen types usually depicted in American textbooks

Written with the usual conciseness and clarity of the French language, this volume will be fascinating to workers in the fields with which it is concerned The line drawings of M Izard are extremely helpful to the foreign reader in comprehending the text

ULYSSES GRANT DAILEY, M D

Integrated Gynecology: Principles and Practice. By I C Rubin and Josef Novak New York, Toronto and London The Blakiston Division, McGraw-Hill Book Company, 1956 In 3 volumes Illustrated

This remarkable three-volume work by two outstanding and well-known gynecologic surgeons has justly been characterized as "the best available source among the English works recommended without reservation for broad use" We unreservedly concur in this conclusion Every phase of knowledge pertaining to gynecology is contained in this work It does not limit itself to gynecologic information, as is stated in the preface "the main purpose of the book is to *integrate* gynecology with all other specialties and general medicine" This momentous task has been fulfilled excellently The work begins with the embryologic aspects of the female genital apparatus and its functions, and enters into a discussion of morbid condition, pathologic changes and therapeusis throughout life Neoplastic transformations of the female genital apparatus are thoroughly covered, as are the operative procedures employed in their treatment

The work can be highly recommended for the student, the medical man, the surgeon and all interested in the subject

The bibliography is exceptionally well organized The paper, printing and illustrations are of the finest, as befits so explicit, instructive and valuable a text

M T

The Biologic Effects of Tobacco By Ernest L Wynder, with a foreword by Joseph Garland Boston and Toronto Little, Brown & Company, 1956 Pp 215

"The Biologic Effects of Tobacco" is a timely publication summarizing the present status of knowledge of tobacco The editor has been successful in obtaining prominent collaborators The book is divided into numerous chapters, discussing chemistry, pharmacology, cardiovascular system, neoplastic diseases, gastrointestinal tract, allergy and "cause and effect" The theoretical chapters are well written and easy to understand

The material in Chapter 4, "Neoplastic Diseases written by the editor, is debatable It is, of course, a difficult task to discuss objectively so controversial a subject as the influence of tobacco upon cancer of the respiratory tract The reviewer feels that too much emphasis has been placed upon the literature proving a connection between tobacco and carcinoma of the bronchus Well documented papers, as those written by Hueper, which are not in complete agreement with this theory, are just briefly mentioned

The last chapter, "Cause and Effect" by E Cuyler Hammond, is an interesting, almost philosophic dissertation

All in all, this book is very well written It is a "must" in the library of anybody who is interested in the carcinogenic effect of tobacco

WERNER F EISENSTAEDT, M D

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Contributors of scientific articles for publication in The Journal of the International College of Surgeons from Europe, the Near East and the Middle East should send their articles to:

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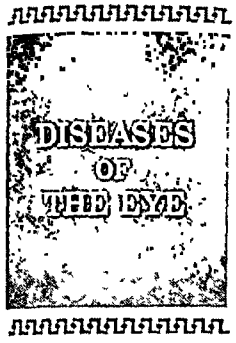

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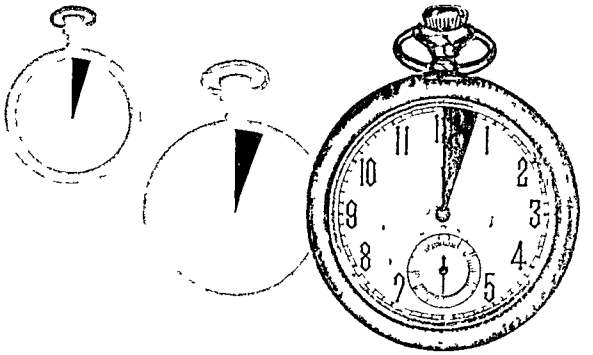

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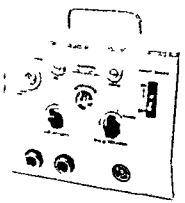

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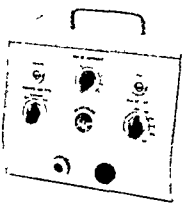

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Injuries to the Small Bones
James R. Regan, M.D., F.A.C.S., F.I.C.S., Milwaukee, Wisconsin

Ovarian Cyst Following Supracervical Hysterectomy
Henry E. Steadman, M.D., F.I.C.S., Hapeville, Georgia

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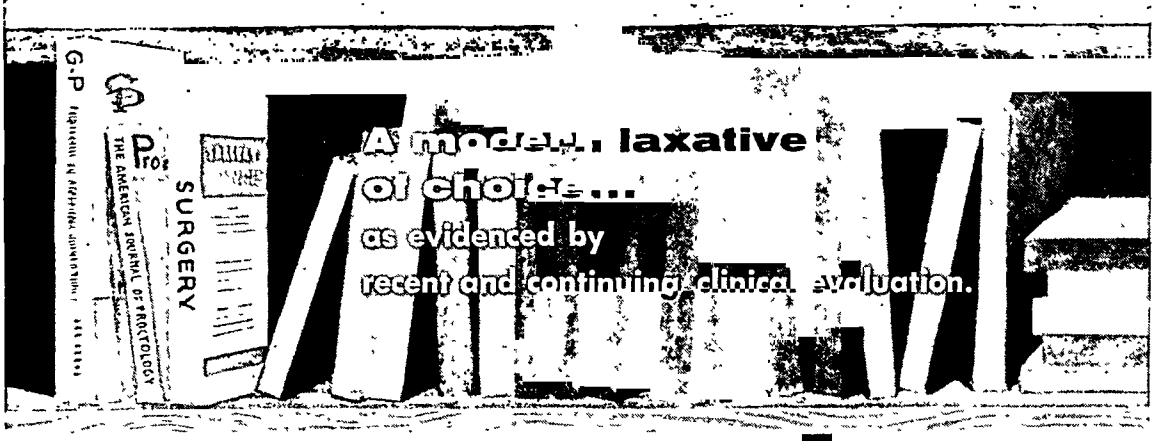
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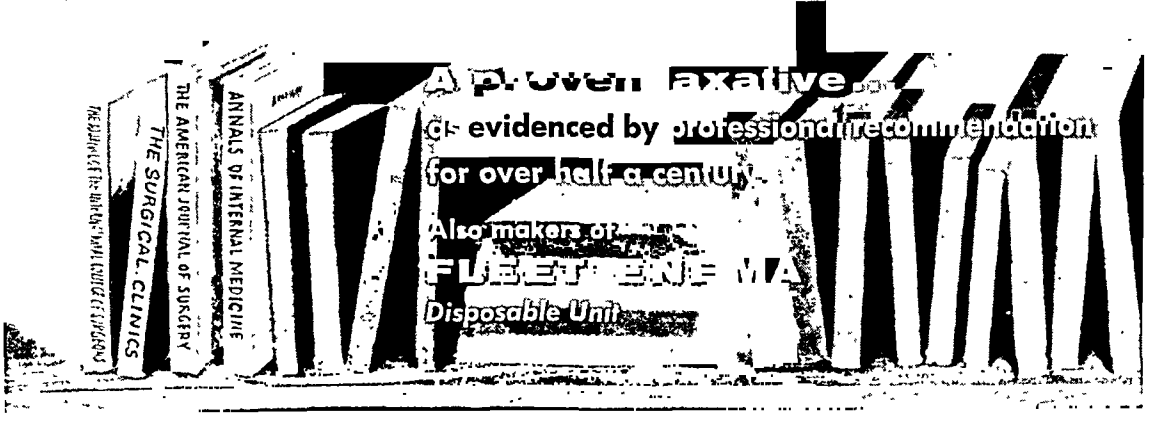
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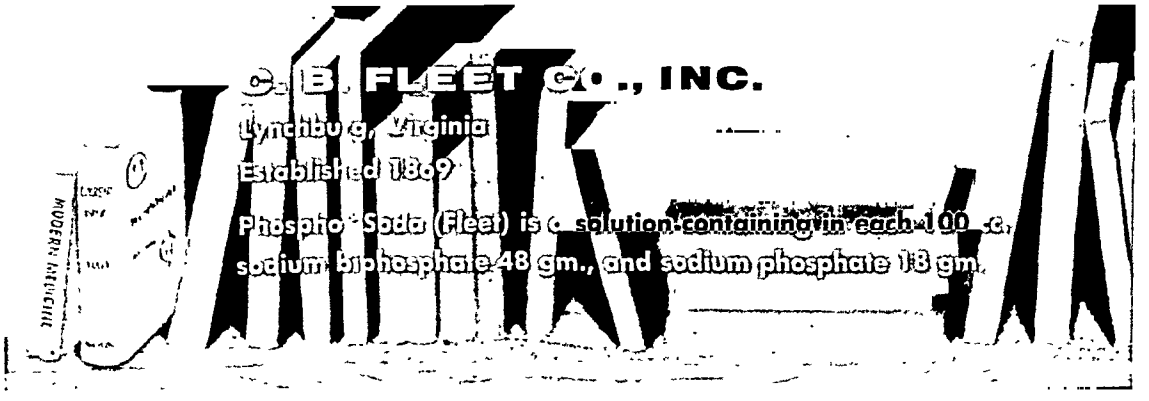
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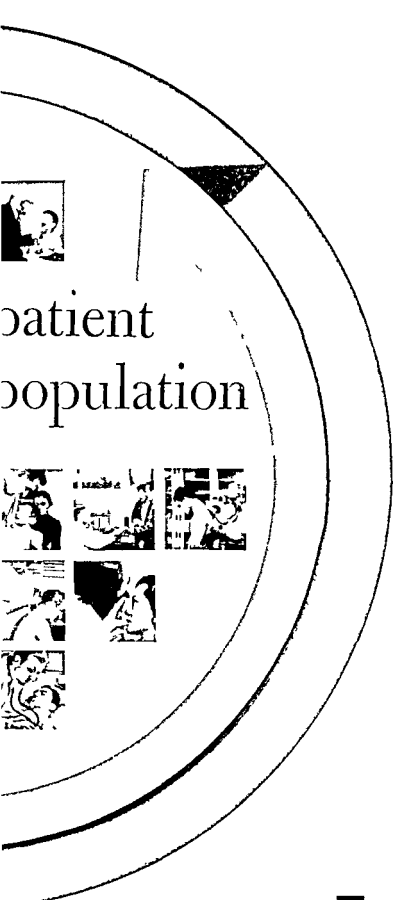

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By ERVIN EPSTEIN, M.D.

Assistant Clinical Professor of Medicine (Dermatology), Stanford University Medical School, San Francisco, California; Chief of Dermatology and Syphilology, Highland-Alameda County Hospital; Diplomate, American Board of Dermatology and Syphilology, etc.

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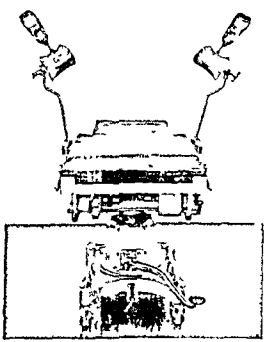

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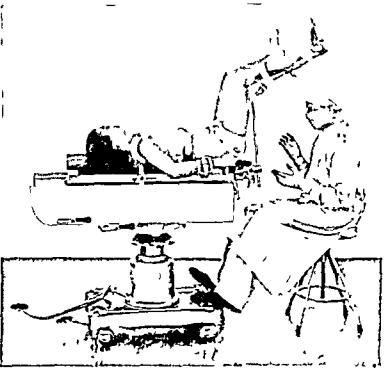

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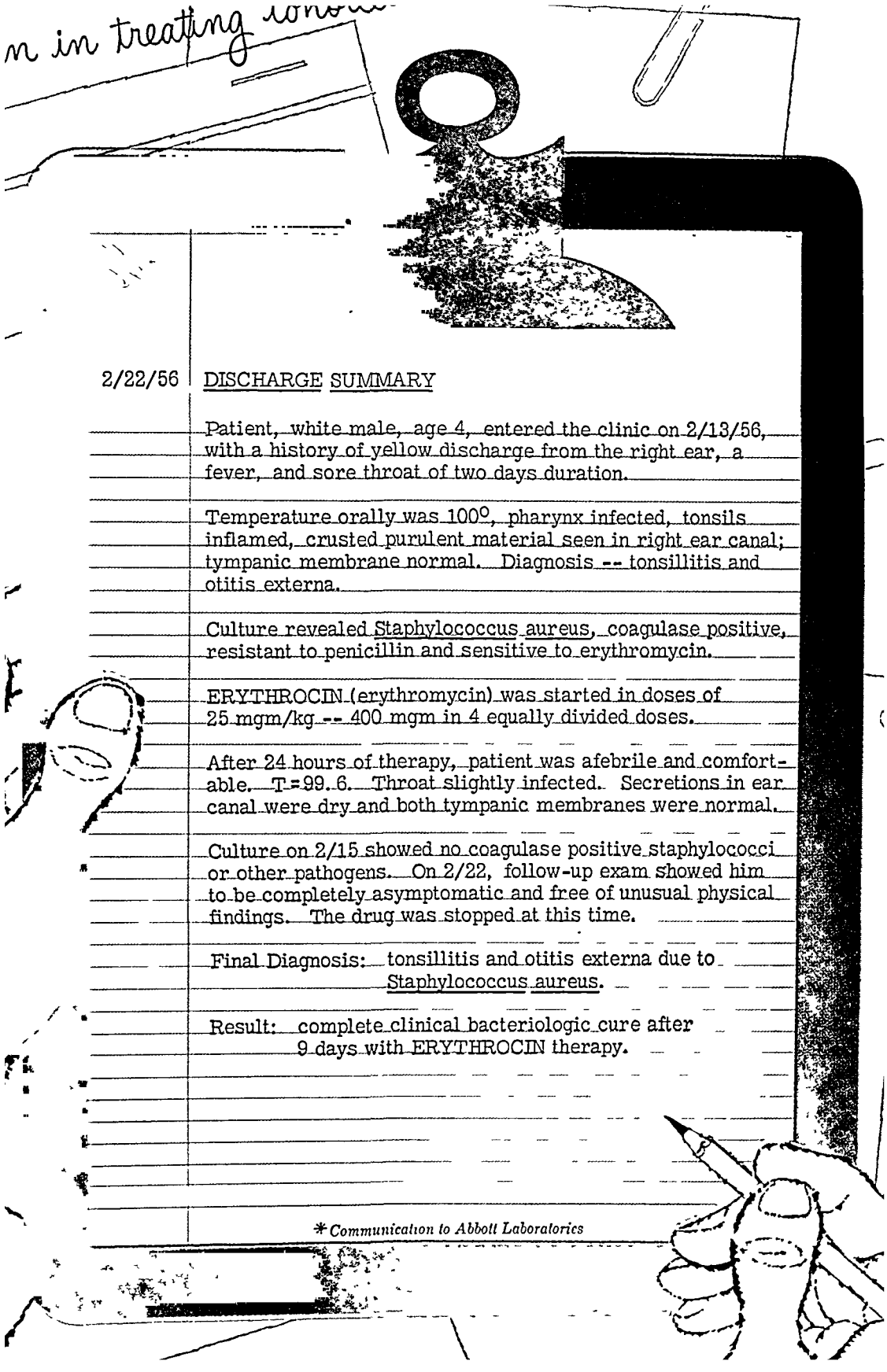

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General Surgery

Pancreatosplenectomy or Hepatectomy Combined with Gastrectomy in the Treatment of Carcinoma of the Stomach

KOMEI NAKAYAMA, M.D., F.I.C.S.*

CHIBA, JAPAN

DESPITE the improvement in irrradiation therapy and the advent of chemotherapy for carcinoma, these current forms of treatment have had little effect on carcinoma of the stomach; hence, surgical removal of the entire lesion, including all the nodes involved, at an early date is still the only therapeutic measure that offers cure of malignant disease of the alimentary canal. Resection *en masse* of the adjacent organs involved has appeared to meet the prerequisites for such a result. This radical resection has two purposes: first, to enlarge the scope of indications for operation in cases of advanced cancer; second, to obtain a "radical cure" in the true sense by removing the entire lesion in the early stages. In either situation there are a variety of adjacent organs that may require resection —among them the pancreas, the spleen, the liver, the colon and the kidney. The scope of operation should be limited on the basis of observations of the postoperative physiologic status, which [illegible] I have conducted [illegible] subject. Our ex[illegible]

*Professor of Surgery, School of Medicine, Chiba University, Chiba.

Read at the Twenty-First Annual Congress of the United States and Canadian Sections, International College of Surgeons, Chicago, Sept. 9-13, 1956.

Submitted for publication Sept. 24, 1956.

TABLE 1.—*Survey on Operative Details in the En Masse Resection of Four or More Abdominal Organs, Nakayama Surgical Department, to May 1956*

Organs Resected en Bloc	*Number of Cases*	*Operative Mortality*	
		Number	*Per Cent*
Entire stomach, tail of pancreas, spleen, liver, small intestine, colon and left adrenal gland	2	1	50
Entire stomach, tail of pancreas, spleen, liver and left kidney	1	0	
Entire stomach, tail of pancreas, spleen and liver	5	0	
Entire stomach, tail of pancreas, spleen and colon	12	0	
Stomach, head of pancreas, duodenum, gallbladder and colon	2	1	50
Stomach, head of pancreas, duodenum and gallbladder	1	0	
Stomach, head of pancreas, duodenum and colon	1	1	100
Cardia, tail of pancreas, spleen and liver	2	0	
Cardia, tail of pancreas, spleen and colon	1	0	
Total	27	3	11.11

TABLE 2.—*Carcinomatous Infiltration of Adjacent Organs (367 Cases)*

	Carcinoma of Cardia 78 Cases, %	*Carcinoma of Body of Stomach 58 Cases, %*	*Carcinoma of Pylorus 211 Cases, %*	*Carcinoma of Stomach 20 Cases, %*
Pancreas (Tail	62.8	46.6	0.0	30
Pancreas \Head	0.0	0.0	28.4	5
Liver	15.3	13.0	5.2	5
Retroperitoneum	12.8	0.0	0.0	0
Diaphragm	11.5	0.0	0.0	0
Mesocolon	3.8	13.7	10.4	5
Spleen	1.21	0.0	0.0	0
Gallbladder	1.2	1.7	0.4	0
Transverse colon	1.2	8.6	8.5	10
Ventral peritoneum	0.0	0.0	0.9	0
None	16.6	41.37	56.8	60

bined resection have become abundant; 27 patients have undergone resection of four or more visceral organs (Table 1). The extreme examples are 2 patients who were subjected to resection of seven abdominal organs *en bloc*. Yet in our experience there have been no persistent deficiency syndromes solely due to loss of the organs removed. Accordingly, we are confident that the operative method by which we have routinely performed the *en masse* resection with ease is followed by little persistent ill effects. Sweet, Finsterer and Wangensteen have reported combined resection for malignant disease of the alimentary organs. In this report we wish to introduce the operative method employed routinely in our clinic. In addition to the ease of its performance, it has lowered our operative morbidity and mortality rates.

Pancreatosplenectomy Combined with

Gastrectomy.—This is the operation most frequently performed for carcinoma of the stomach. Before describing it, we shall explain our studies on the nature of cancerous invasion, which offers a logical basis for the procedure.

Important Considerations Supporting the Necessity of the Combined Resection: 1. *Direct Infiltration into the Adjacent Organs.* Direct infiltration of carcinoma of the cardia or the stomach into the neighboring organs is illustrated in Table 2. It will be noted that cancerous invasion of the pancreas is common, especially in cases of carcinoma of the cardia or the body of the stomach. A study was made to obtain a better understanding of the mode of malignant infiltration toward or into the pancreas. This infiltration may be classified into three grades: Grade 1, that which reaches only the capsule of the pancreas and does not invade the parenchyma; Grade 2, that which invades only a part of the pancreatic parenchyma, and Grade 3, that which pronouncedly involves the parenchyma. A histologic study of the specimens obtained from 45 patients treated by pancreatosplenectomy with total gastrectomy revealed Grade 1 infiltration in 60 per cent; Grade 2 infiltration, in 35.5 per cent, and Grade 3 infiltration, in 4.5 per cent. In these circumstances resection of both the pancreas and the spleen must be carried out, because it is obvious that partial resection or mobilization of these adherent parts serves poorly as a means of radical cure of lesions so advanced.

TABLE 3.—*Histologic Observations on Pancreatic Remnant Ligated with Simple Suture in Dogs*

	Atrophy of Parenchyma	*Round Cell Infiltration*	*Hyperplasia of Connective Tissue*
Postoperative Date			
One week	+ +	+ +	+
Three to five weeks	+	+	+ +
Fifteen weeks	—	—	+ + +

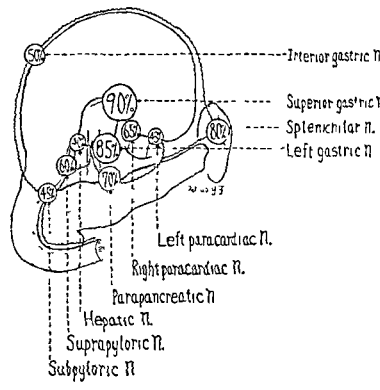

Fig. 1.—Survey of nodal involvement (40 cases with pancreatosplenectomy with total gastrectomy. Carcinoma of cardia, 22 cases; carcinoma of body of stomach, 18 cases).

2. *Nodal Involvement.* After pontamine sky blue had been injected into the various zones of the stomach, the lymph drainage from this organ was studied closely during the operation. As has been pointed out repeatedly, metastases from cancer of the cardia or the body of the stomach often reach beyond the regional nodes to the parapancreatic and splenic hilar nodes—a fact well corroborated by our histologic study of specimens obtained from 40 patients treated by pancreatosplenectomy with total gastrectomy (Fig. 1). This study revealed that the chance of metastases to the parapancreatic and splenic hilar nodes approximated that of invasion of the regional lymph nodes. It will be readily understood that a radical cure of such a tumor is attainable only by resection of the pancreas and the spleen *en masse.* This, when combined with removal of the stomach, automatically removes the involved lymph nodes.

A Rational Scope of Resection of the

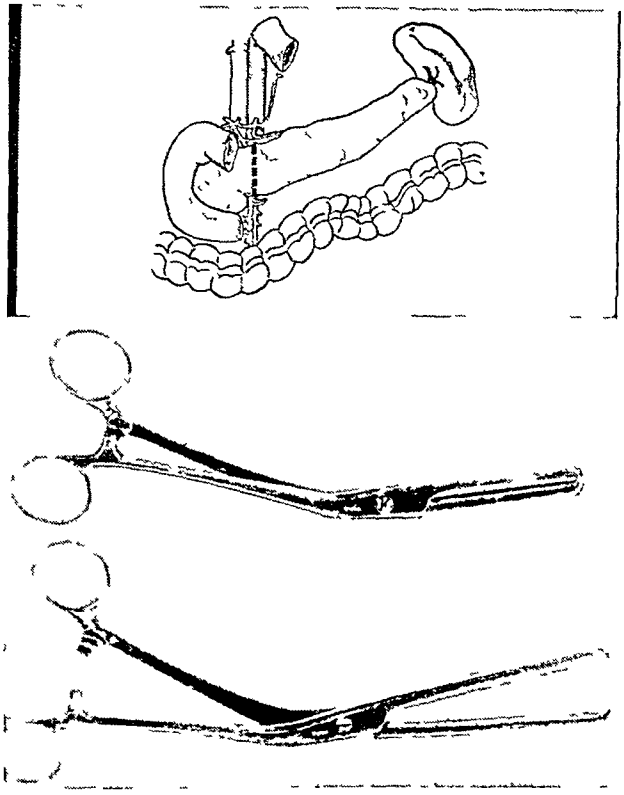

Fig. 2.—*Above,* rational line of transection of pancreas. *Below,* pancreatic crushing clamp.

Pancreas and the Spleen.—One of our purposes was to establish rational limits by the removal of these two organs—one that would offer maximal success in removal of the malignant tissues with minimal postoperative ill effects.

The rational line of transection of the pancreas used by us is that line, vertical to the longitudinal axis of the pancreas, which originates at the point where the middle colic artery and the lower margin of the pancreas meet (Fig. 2 *above*). Malignant infiltrative adhesion to the pancreas was observed to be situated, on the average, within the portion 6 cm. from the left end of the gland, while this transecting line is located 12 cm. from the same end. The adherent infiltration is completely included in the area of resection. The rational transecting line is situated slightly to the right of the axis of the celiac artery. If the pancreas is transected along this line, these anatomic relations permit not only the automatic removal of the parapancreatic and splenic hilar nodes but an improved visualization of the hepatic, celiac and other important nodes involved, thus making it possible to remove the latter nodes with ease. This rational transection usually yields resection of one-half to two-fifths of the length of the pancreas and two-fifths to three-fifths of its weight.

Operative Technic.— 1. *Sequence of Attack:* The surgical attack should take place first in the right retroperitoneal area, rather than in the splenic or the left retroperitoneal space.

2. *Treatment of the Pancreatic Stump Left in the Abdominal Cavity; Method:* Before the pancreas is transected, the posterior surface of this organ is mobilized along the proposed line of transection by blunt dissection, and then the pancreas is clamped with two pancreatic crushing clamps juxtaposed to each other along this line, and crushed (Figs. 2 [*below*] and 3). When the organ is crushed with these clamps (devised by myself), only the parenchyma, vessels and ducts of the gland are crushed; the capsule is left intact. For treatment of the crushed stump, a simple silk ligature placed near the stump is always sufficient. In other words, neither cauterization nor the use of multiple ligatures is needed, and there is a minimal chance of bleeding or leakage of pancreatic juices from the remnant stump.

Animal Experimentation on the Stump of the Pancreatic Remnant: Ten dogs were treated by this simple ligature near the stump of the pancreas. Histologic study was performed upon 3 dogs one week after the operation, 3 after three to five weeks, and four after fifteen weeks. From this study I noted that (1) at one week, partial atrophy of the parenchyma near the stump had occurred, in combination with a round cell infiltration and the production of connective tissue; (2) at

three to five weeks the trend toward atrophy of the parenchyma had begun to subside and a noticeable production of connective tissue had occurred; (3) at fifteen weeks, the stump was completely replaced by cicatricial tissue (Table 3).

Clinical Observations: No postoperative complications due to blowout of the stump were ever experienced. Histologic study of a pancreatic stump obtained from a patient who died of recurrent disease three months after the operation, revealed complete healing of the stump, which was in entire accordance with the results of the animal experiment.

Drainage in the Left Lateral Portion of the Abdomen: After removal of these organs, effusions accumulate in the dead space in the left side of the abdominal cavity and interfere with the local healing process; a polyethylene film, therefore, is introduced into this space. The safety of this method of treating the stump was verified by the fact that no effusions containing pancreatic enzymes were observed in any of the cases.

Functional and Morphologic Changes in the Pancreatic Remnant.—1. *Exogenic Secretion:* Exogenic secretion was studied in the patients operated on, as well as in the dogs with the external pancreatic fistulas. The following points were noted: When my rational transection is employed in pancreatectomy, the volume of pancreatic juices as well as the output of enzymes per cubic centimeter is reduced two or four weeks after the operation. Thereafter these values increase gradually, and in one year they reach the level associated with noncombined gastrectomy, except for the output of lipase. Histologic study revealed hypertrophy of the pancreatic remnant and proliferation of parenchymatous cells, both of which are entirely consistent with the recovery status as judged by the clinical picture. Tests of digestion in the patients operated on revealed that the ability

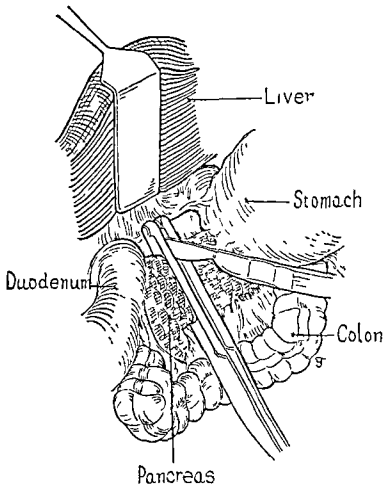

Fig. 3.—Pancreas transected between two crushing clamps placed across gland.

to digest approximated that following noncombined gastrectomy, except that there was a slight drop in the coefficient of fat digestion. Thus it was confirmed that such marked compensatory properties eliminated the possibility of persistent ill effects on the postoperative exogenic secretion of this gland.

2. *Endogenic Secretion:* The endogenic secretion was also studied. In the pancreatectomized patients only transient and occasional hyperglycemia or glycosuria was noted within a few days after the operation. The majority of them took the course indicated in Figure 4, returning completely to the normal fasting blood sugar level and thereafter evincing no persistent disturbances. Testing by intravenous or oral administration of dextrose showed dextrose-tolerance curves similar to the normal throughout the follow-up period, although a slightly abnormal tolerant curve was often elicited within four

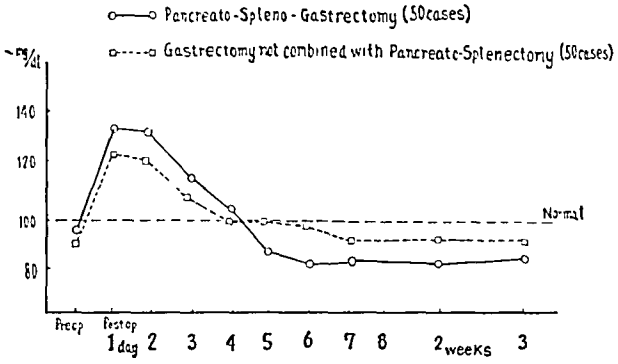

Fig. 4.—Fasting blood sugar level as observed in study of endogenic secretion in men.

weeks after the operation. This abnormal curve, however, differed from that associated with diabetes. In the animal experiment on dogs from which three-fifths or four-fifths of the pancreas had been removed, the islets of Langerhans showed not only astonishing proliferation but pronounced hypertrophy that resulted in a somewhat different shape. Neither the hydropic nor the degenerative changes peculiar to diabetes mellitus, however, were noted. The functional changes herein described as following pancreatectomy indicate that compensatory changes and regenerative signs appearing after removal of about two-fifths of the pancreas remain as physiologic changes.

Diagnosis and Indications for Operation.—1. *Roentgenographic Study:* Competent roentgen study is essential to determine the indications for this type of operation. My own conclusion, obtained from roentgen study and pathologic study of 110 patients, is that if carcinoma originating in the cardiac portion or the body of the stomach has infiltrated more than 5 cm. along the lesser curvature of the stomach, there is a relative indication for his surgical procedure; if it has infiltrated more than 7 cm. along the lesser curvature, there is an absolute indication. This criterion is based upon the fact that infiltration extending more than 5 cm. along the lesser curvature was seen in combination with a 70 to 80 per cent incidence of involvement of the parapancreatic and splenic hilar nodes, and that invasion to the extent of more than 7 cm. was associated with an incidence of 100 per cent of nodal involvement.

Another means of evaluating the grade of retroperitoneal infiltration is transparietal splenovenographic study, which is now being used in the management of 120

TABLE 4.—*Operative Details of Pancreatosplenogastrectomy, Nakayama Surgical Department, April 1950 to March 1955*

	Operative Method	*Number of Cases*	*Total Number of Cases*	*Pancreato-splenectomy*	*Splenectomy*
Cardiectomy	Antethoracic esophagogastrostomy	1	42	1	0
	Intrathoracic esophagogastrostomy	21		21	0
	Intra-abdominal esophagogastrostomy	20		19	1
Total gastrectomy	Antethoracic esophagojejunostomy	1	68	1	0
	Intrathoracic esophagojejunostomy	14		13	1
	Intrathoracic esophagojejunostomy (transplantation)	9		9	0
	Intra-abdominal esophagojejunostomy	21		21	0
	Intra-abdominal esophagojejunostomy (transplantation)	16		16	0
	Intra-abdominal esophagoduodenostomy (end-to-end)	7		7	0
Gastrectomy	Subtotal gastrectomy	1	1	0	1
	Partial gastrectomy	2	2	0	2
Total			113	108	5

TABLE 5—*Operative Mortality Rate from April 1950 to March 1955*

Operative Method	*Number of Cases*	*Number of Deaths*	*Operative Mortality, %*
Pancreatosplenogastrectomy	113	2	1.77
Gastrectomy not combined with pancreatosplenectomy	238	7	2 94

patients with carcinoma of the stomach. Stenosis, abnormal flexion of the vein, retrograde flow or stagnation of the venous blood, pressure on the vein by adjacent structures and irregularity of the venous wall are all suggestive of carcinomatous invasion toward the retroperitoneal space. Intelligent interpretation of these data adds other important criteria for determining the indications. Pronounced abnormalities are often indicative of the unfeasibility of radical operation (Fig. 5).

Statistical Surveys.—Statistics in Operative Results: One hundred and thirteen patients with carcinoma of the cardia or body of the stomach were treated by pancreatosplenogastrectomy in the Nakayama Surgical Department between April 1950 and March 1955. The operative details are listed in Table 4. There were 2 deaths within one month after the operation, a 1.77 per cent operative mortality rate (Table 5). This rate was less than that of gastrectomy *per se,* which is 2.94 per cent. Of the 2 patients who died, 1 died on the twenty-sixth postoperative day, owing to a leak at the anastomosis in the thorax, and the other on the ninth postoperative day, of peritonitis due to a leak at the suture line. No causative factors attributable to splenectomy or pancreatectomy were ever noted. The period of postoperative hospitalization averaged thirty-three days each for 113 patients.

2. *Operability Rate:* Patients with cardiac carcinoma treated by pancreatosplenogastrectomy since 1950 were compared with those treated solely by gastrectomy during the same period. According to this study, the rate of operability had been improved up to 65 per cent (Fig. 6). Inoperability (for radical treatment) was also investigated. The main reason that a radical cure was not feasible before application of this operative technic was that retroperitoneal infiltration (including invasion of the pancreas and the lymph nodes around the spleen) is an early occurrence in the growth of such carcinomas. In comparison with an inoperability rate of 24 per cent prior to 1950, when the pro-

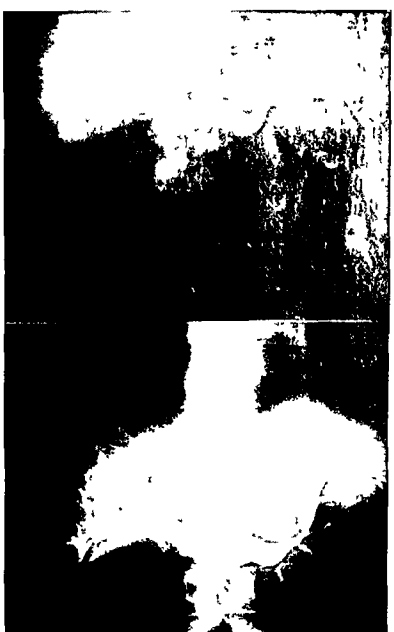

FIG. 5—*Above,* pathologic splenovenogram with pancreatospleno omy s ble. *Below,* pathologic sp ospleno- gas

TABLE 6.—*Period and Rate of Survival of Patients Undergoing Pancreatosplenogastrectomy, Nakayama Surgical Department, January 1950 to June 1954*

	Jan. 1, 1950 to Dec. 31, 1950	Jan. 1, 1951 to Dec. 31, 1951	Jan. 1, 1952 to Dec. 31, 1952	Jan. 1, 1953 to Dec. 31, 1953	Jan. 1, 1954 to June 30, 1955	Total	Per Cent
Number of cases	2	8	24	24	17	75	
Operative deaths	0	0	1	1	0	2	
Number of cases not followed	0	1	0	0	0	1	
Number of cases followed	2	7	23	23	17	72	
6-month survival	1	5	14	10	7	37	51.39
1-year survival	1	3	9	7		20	36.36
2-year survival	1	3	6			10	31.25
3-year survival	1	3				4	44.44
4-year survival	1					1	50.00

cedure had not yet been adopted in this clinic, its rate of inoperability since 1950 is as low as 10 per cent. This technic, therefore, has enlarged the limits of radical cure for carcinoma of the cardia.

3. *Follow-up Results:* This survey includes 72 patients who underwent pancreatosplenogastrectomy between 1950 and December 1954. Interestingly, the survival rate of these patients after the lapse of one year is higher than that of the controls, which indicates the superiority of the new operative procedure (Tables 6 and 7; Fig. 7).

Hepatectomy Combined with Gastrectomy.—Not infrequently surgeons encounter the more or less advanced carcinoma located at the anterior surface of the cardia which has already invaded the left hepatic lobe by direct infiltration. In such circumstances, if metastases to nonresectable structures have not yet taken place,

TABLE 7.—*Period and Rate of Survival of Patients Undergoing Gastrectomy Not Combined with Pancreatosplenectomy, Nakayama Surgical Department, January 1950 to June 1954 (Cardiectomy, Intrathoracic or Intra-Abdominal, Plus Total Gastrectomy)*

	Jan. 1, 1950 to Dec. 31, 1950	Jan. 1, 1951 to Dec. 31, 1951	Jan. 1, 1952 to Dec. 31, 1952	Jan. 1, 1953 to Dec. 31, 1953	Jan. 1, 1954 to June 30, 1955	Total	Per Cent
Number of cases	17	41	55	38	19	170	
Operative deaths	0	0	4	0	0	4	
Number of cases not followed	1	1	3	5	2	12	
Number of cases followed	16	40	48	33	17	154	
6-month survival	9	32	23	23	14	101	65.6
1-year survival	6	22	12	18		58	42.3
2-year survival	8	9	8			25	24.0
3-year survival	4	4				8	14.0
4-year survival	4					4	25.0

resection of the liver should positively be carried out as a part of this operation, as advocated by Wangensteen and others, thus permitting the enlargement of operability.

A number of reports on resection of the liver have accumulated. All of these, nevertheless, as currently performed, necessitate complicated maneuvers that seem far from desirable from the practical standpoint. Moreover, most of them are limited to solitary resection of the liver, and some of these are too theoretical to be resorted to in practice. There is a tendency, according to most of the reports, to employ a large number of sutures and a variety of packs to guard against uncontrollable hemorrhage, which appears to be the major deterrent for most surgeons who operate on the liver, though there is ample clinical evidence that the danger from bleeding is far from insurmountable. From this point of view, the fear of eventual infection or biliary drainage always leads to special attention to the provision of an avenue of drainage, and this naturally complicates the operative procedure.

My intention here is to present a simplified method of hepatic resection developed by myself, which is particularly useful in resection *en masse* of the adjacent organs in cases of gastric cancer when a decrease in operating time is needed. Since this method was first employed in hepatic resection, it has become a procedure routinely feasible, and is employed without fear of either hemorrhage or biliary drainage after operation. This method is preferably employed for resection of the left lobe, partial or total; the caudate or quadrate lobe, and a part of the right lobe, the necessity for which is often encountered. It is not recommended for massive resection of the right lobe.

Operative Technic. — Resection of the Left Hepatic Lobe: A high midabdominal incision is made. The tenuous ligamentous attachment between the diaphragm an the left lobe is severed toward the dia phragmatic hiatus (Fig. 7 [*upper left*]) Beyond the hiatus, the severance is ex tended to the right crus of the diaphragm after which the left lobe can be readil rotated forward and slightly to the right Then the Nakayama crushing clamp afore mentioned is placed across the intact por tion of the left lobe. After crushing, th lobe is severed with a sharp knife (Fig. [*upper right*]). Manual grasp of the clamp with the pressure applied gradually, is suf ficient to gain a complete crushing effec on the parenchyma along the blade of th clamp, because this instrument is so con structed that the parenchyma alone is crushed, the capsule being left intact. Re

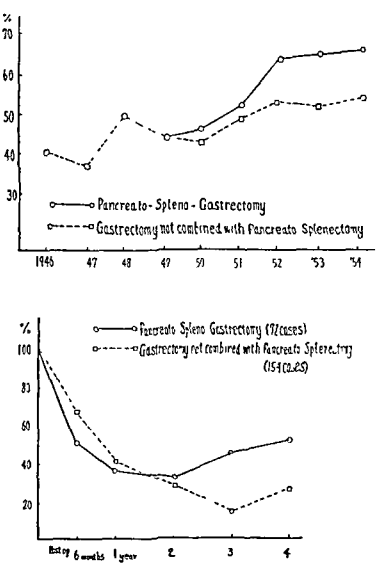

Fig. 6.—*Above*, operability of thoracic esophageal and cardiac carci ...nuary 1946 to December 1954). *Belo* (Jan 195 t

section is done about 0.5 cm. beyond the clamped line.

The next step is the treatment of the lobar remnant. A few ligatures are applied to major vessels appearing at the bare surface. Two or three sutures of a larger size are passed through the entire thickness of the lobe along the inside of the blade clamping (Fig. 7, lower drawing). One of the sutures is then pulled upward, thus including the upper half of transection, and one of the others downward, thus including the lower half; then each of the sutures is tied in the gentlest manner as the clamp is gradually removed. Needless to say, one silk ligature suffices for treatment of the stump when the resection is small.

Neither packs, such as gauze or gelfoam, nor autografts, such as tissues of the greater omentum or the peritoneum, are needed for treatment of the bare surface; nor is the use of the cautery after required. As a matter of fact, a number of experimental and clinical data collected after this operation at our clinic proved that there was little risk of parenchymatous hemorrhage or biliary drainage.

After completion of the operation, a polyethylene film drain is placed in the homolateral side of the upper part of the abdominal cavity. This is usually withdrawn at about ten days after the operation, depending on the amount of drainage.

2. *Resection of the Right Hepatic Lobe:* For removal of a solitary tumor located in the right lobe, the wedge form of resection advocated by Zweifel-Payr, Kussenetzoff and Pansky had been employed. Application of my clamp, however, enables me to carry out the procedure in a much shorter time, obviating the conventional troublesome maneuvers of suturing.

Histologic Study: The most important aspect of appraisal of this simplified hepatectomy is the manner in which healing takes place in the remnant. Histologic study of specimens obtained after autopsy supplied me with valuable information as to this. Twenty-five days after the opera-

TABLE 8.—*Operative Details on Combined Resection of the Liver, Nakayama Surgical Department, to End of April 1956*

Organs Resected en Bloc	*Number of Cases**	*Operative Deaths and Mortality Rate*
Entire stomach, liver, spleen, tail of pancreas, small intestine, colon and left adrenal gland	2	1 (50 %) because of leak at anastomosis
Entire stomach, liver, spleen, tail of pancreas, and left kidney	1	0
Entire stomach, liver, spleen and tail of pancreas	4	1 (25 %) because of leak at anastomosis
Entire stomach, liver and spleen	2	0
Entire stomach and liver	13 (1)	0
Cardia, liver, spleen and tail of pancreas	1	0
Cardia and liver	6 (1)	0
Stomach and liver	5 (2)	0
Gallbladder, liver and colon	1	0
Gallbladder and liver	2	0
Colon and liver	2	0
Total	39 (4)	2 (5.13 %)

*In column 2, figures in parentheses indicate that ulcers were present.

tion, infiltration of fibroblasts and round cells had taken place centripetally into the necrotic areas formed by each ligature near the stump, and there were scattered areas of fatty degeneration in the neighboring portion. Four months later, replacement with a thick layer of connective tissue over the stump was observed, associated with fibroblastic thickening of Glison's capsule and cicatricial atrophy of the neighboring hepatic tissues. In the light of these facts, one may assume that the cicatricial repair of the bare surface is completed in four months after the operation.

Statistical Surveys.—Statistics on Operative Results: Of 45 cases, the total number in which hepatic resection had been done in my clinic by the end of April 1956, the patients in 39 cases were subjected to hepatectomy as a part of the resection *en masse* of the neighboring organs (Table 8). The cause of death in 2 cases after more than four organs had been resected *en masse* was empyema of the chest, due to a leak from the anastomotic site, and no deaths ever occurred that were attributable to the operation itself. This procedure also proved feasible for gastric ulcer, resection of which was difficult because of its penetration into the liver unless it was resected *en bloc* with the adherent portion of the liver. Some of these ulcers were malignant.

2. *Statistics on Follow-up Results:* In contradistinction to benign lesions, malig-

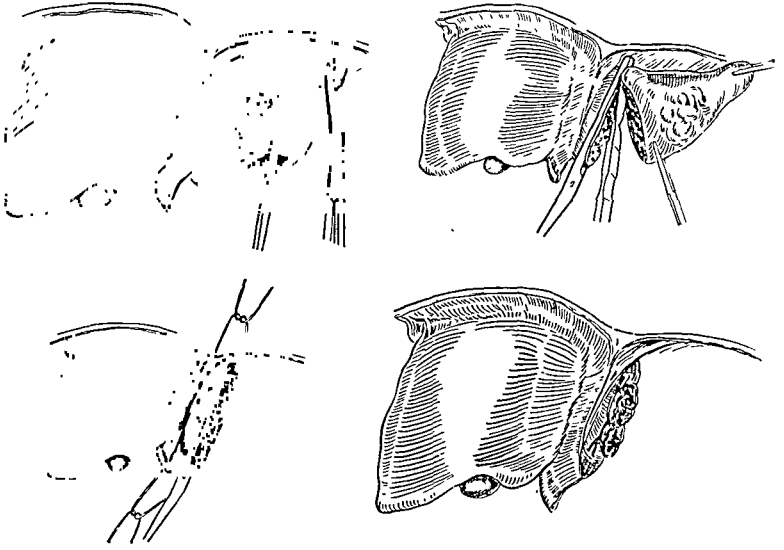

Fig. 7.—*Upper left*, ligamentous attachment between diaphragm and left hepatic lobe severed toward diaphragmatic hiatus. *Upper right*, hepatic lobe, after being crushed, severed with knife. *Lower left*, tying of two large silk sutures placed through entire thickness of liver. *Lower right*, treatment of bare surface completed.

nant lesions were associated with rather poor follow-up results. It must be borne in mind, however, that most of the malignant lesions included in this survey were so advanced that recurrence was inevitable. It must be pointed out also that there is a three-year survivor among those with malignant lesions. It is my impression that, since surgical removal remains unique as a curative measure against malignant disease, attempts must be made to resect the liver *en bloc* when there are indications for this procedure.

Hepatic function returns to the preoperative status in four weeks after this operation and maintains this level unless the disease recurs.

CONCLUSION

Gastrectomy combined with pancreatosplenectomy or hepatectomy for cancer of the stomach is presented, with a tabulation of data obtained from experimental studies. Emphasis is placed throughout this report on the introduction of the author's simplified procedures for transection of the pancreas as well as resection of the hepatic lobe.

The opinion is expressed that these operative methods should be used more extensively in appropriate cases.

Author's Note: Dr. T. Tamiya's translation of this article is acknowledged with appreciation.

CONCLUSIONES

Gastrectomías combinadas, con pancreatoesplenectomías o hepatectomías por cáncer del estómago se presentan, con una tabulación de los datos obtenidos de estudios experimentales. Se hace énfasis en este reporte en la introducción de los procedimientos simplificados del autor para transección del pancreas así como resección de un lóbulo hepático.

Se expresa la opinión de que estos métodos operatorios, debían ser usados más extensamente en casos apropiados.

CONCLUSIONI

Viene presentato uno studio sulla gastrectomia combinata a pancreatosplenectomia e a epatectomia, con una serie di dati sperimentali. Viene descritta una tecnica semplificata per la resezione del pancreas e del fegato.

Questi metodi dovrebbero essere usati con maggior larghezza nei casi appropriati.

CONCLUSOES

Estuda a combinação da gastrectomia com a pancreato-esplenectomia ou com a hepatectomia para o cancer do estomago, analizando os dados obtidos em estudos experimentais. Salienta nesta comunicação a modificação pessoal para simplificar os métodos de ressecção pancreatica e do lóbo hepático.

Considera que êsses processos cirúrgicos devam ser mais amplamente utilizados nos casos selecionados.

RÉSUMÉ

L'auteur présente une technique de gastrectomie combinée avec une pancréatosplénectomie ou hépatectomie pour cancer de l'estomac, avec un tableau des résultats obtenus lors d'études expérimentales. Il insiste sur les techniques personnelles simplifiées qu'il a inaugurées pour la dissection transversale du pancréas ainsi que pour la résection du lobe hépatique.

A son avis ces méthodes devraient être utilisées plus souvent dans tous les cas appropriés.

SCHLUSSFOLGERUNGEN

Es liegt ein Bericht über die mit Pankreas- und Milzresektion oder mit Leber-

resektion kombinierte Magenresektion beim Magenkrebs und eine tabellarische Aufstellung der aus dieser experimentellen Arbeit gewonnenen Ergebnisse vor Der Verfasser hebt wiederholt die von ihm eingefuhrte vereinfachte Methode zur Durchschneidung der Bauchspeicheldruse und des Leberlappens hervor

Der Verfasser vertritt die Ansicht, dass diese operativen Vorgange in geeigneten Fallen eine we tere Anwendung verdienen

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In writing a history of diseases, every philosophical hypothesis which hath prepossessed the writer in its favor, ought to be laid aside, and then the manifest and natural phenomena of diseases, however minute, must be noted with utmost accuracy, imitating in this the great exactness of painters, who in their pictures copy the smallest spots or moles in the originals, for it is difficult to give a detail of the numerous errors that spring from hypothesis

—*Sydenham*

Contributions of Modern Anesthesia to Improvement in Surgical Technic

JOHN S. LUNDY, M.D., D.A.B.

ROCHESTER, MINNESOTA

IN my opinion it is fair to say that modern anesthesia not only has contributed greatly to surgical technics but actually has made many of them possible. This is certainly true of operations within the thorax.[1]

Preliminary Medication, an Inseparable Factor.—I should like to make it clear that in my mind the term "anesthesia" includes preliminary medication. Many still in active practice can remember that for a long time the surgeon was almost completely dependent upon ether, nitrous oxide with ether, ethylene and cyclopropane. Chloroform had long been available but had fallen into disrepute. Diathermy for the control of bleeding was available but sometimes could not be used because of the danger of fire and explosion.

Today the technic of general anesthesia most favored is induced with pentothal sodium given intravenously, a small dose of succinylcholine to facilitate the introduction of an intratracheal tube and the administration of nitrous oxide and oxygen by the tube thus emplaced, plus the intermittent administration of pentothal sodium and curare intravenously. This particular technic enjoys the favor of surgeons, patients and anesthesiologists alike.

The advent of the tranquilizing drugs has made it possible to insure the patient a restful sleep during the night before the operation. He needs such a sleep to prepare him to tolerate the stress of anesthesia and operation. To bring about the desired state of sedation, I prefer to call upon the patient the night before the operation and to ask him about special sensitivity to drugs and any other factors that may concern me during the operation. If he is an adult, I then administer 25 mg. of promethazine hydrochloride (phenergan hydrochloride) by mouth and 500 mg. of placidyl for sleep. I then plan to see the patient early in the morning, before the operation, and to learn how well he slept. Some patients sleep all night and have to be awakened in the morning. When that occurs I am sure I shall not need to order as much medication as would have been required had the patient not slept well. I find that very few patients fail to achieve a good night's sleep when this medication is employed.

On the morning of the operation I order another 25 mg. of promethazine hydrochloride (phenergan hydrochloride) to be given intramuscularly, with 2 mg. of levorphan tartrate (levo-dromoran tartrate) and 1/150 gr. of atropine. The use of this medication, because of the synergistic action of phenergan hydrochloride in combination with other drugs, means that anesthesia must be induced slowly. The dose of, say, pentothal sodium, must be reduced, the reduction amounting to about 50 per cent.

The Importance of Oxygen.—A mixture of oxygen and nitrous oxide is used, and more oxygen than usual is administered. For that reason I have reversed the old

From the Section of Anesthesiology, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

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expression, "nitrous oxide and oxygen," to "oxygen and nitrous oxide," so that I can place the emphasis on *oxygen*, which is the important component. I am convinced that anoxia must be prevented. I have noted that a flow of 8 liters of nitrous oxide and 2 liters of oxygen per minute will result in an arterial oxygen saturation of about 90 per cent, whereas a flow of 7 liters of nitrous oxide and 3 liters of oxygen per minute will result in an arterial oxygen saturation of 100 per cent. In employing these gases it is important to consider not only percentages but volume flow. The reason is that there are patients who, because of certain untoward conditions in the lungs, require a flow of twice the normal volume. Sometimes the tension in the breathing bag needs to be increased; that is, instead of a pressure of 5 mm. of mercury, pressure of 10 mm. sometimes will be required to achieve proper oxygenation of the blood.

Certainly no one would deny that respiratory depression and especially respiratory arrest should be prevented at all costs. I suspect that sudden wide variations in the *p*H of the blood may explain why necropsy does not reveal the cause of death in a patient who dies during anesthesia. I am much more confident that the *p*H of the blood will be satisfactory if the patient is breathing by means of his own physiologic mechanism than I am if his breathing is maintained by controlled respiration. Controlled respiration allows the anesthesiologist no more than a guess as to what the *p*H of the blood really is.

My own conviction is that cardiac arrest is in some way associated with anoxia, and that anoxia of even two or three minutes' duration may be harmful. The method I have already described is now so widely used that I am bound to point out that any overdose of pentothal sodium or curare, or the preliminary medication alone, or a combination of all these is almost certain to depress respiration; therefore, the antagonists to such drugs as those mentioned become extremely important.

Antagonists of Certain Drugs.—A series of such drugs is now available. An important one is edrophonium (tensilon chloride), which is used to counter the effect of curare. Since an antagonist to curare does exist, I prefer curare to other muscle relaxants. Succinylcholine I regard as important because it allows easy intubation when pentothal sodium is to be used. Pentothal sodium initiates a tendency toward laryngospasm, which also occurs when there is a foreign body in the throat. The amount of succinylcholine needed to abolish laryngospasm is so small that the agent can be used with safety. Other anesthetic agents for intravenous use have been introduced; for example, dolitrone and viadril. The one great advantage they seem to possess is the abolition of laryngospasm, which permits intubation to be accomplished with ease. It soon became evident, however, that a problem arises in the use of dolitrone and viadril—the possibility of thrombophlebitis and thrombosis. Since these complications do not accompany the use of pentothal sodium, it appears that pentothal sodium is preferable at present.

There is also an antagonist to morphine: nalorphine hydrochloride (nalline hydrochloride). It is effective, but it is also expensive. If respiratory depression occurs which is not caused by morphine, and nalline hydrochloride is used to combat it, nalline will produce a morphine-like effect. Nalline hydrochloride is a useful agent, but at present there is a marked tendency toward the use of combinations of drugs. For example, the Rauwolfia series has caused sufficient mental depression when used in the treatment of hypertension to call for the use of a stimulant, such as ritalin or wyamine, along with the Rauwolfia. One of the highly effective anti-

dotes for narcotic drugs is lorfan tartrate (levellophan tartrate). A drug by the name of megimide (β-β-methyl-ethyl glutarimide) has been introduced which will neutralize the effects of barbiturates. Lorfan tartrate, so far as I know, has no untoward side effects and is not expensive. For these reasons it appears to me to be a most valuable addition to the anesthetic technic I have described. I am convinced that I have saved the lives of at least 2 patients recently by means of lorfan tartrate, which is packaged in 1 cc. ampules containing 1 mg. of the drug. This I have given intravenously. Ritalin or wyamine may be used as antagonists to shorten the period of anesthesia.

Operations on Children.—When tonsillectomy and adenoidectomy are to be performed on a child, I use 0.2 cc. of a 10 per cent solution of pentothal sodium per pound of body weight, administered rectally. As soon as the child is sleepy, 1 mg. of phenergan hydrochloride per 10 pounds (4.5 Kg.) of body weight is injected intramuscularly, and a small dose of atropine, usually about 1/450 grain, is given. When this combination is used the patient goes to sleep and is brought to the operating room without knowledge of what is to be done or concern with the prospect. Nitrous oxide and oxygen and ether are administered, and in less than ten minutes intubation can be established and the operation started. This technic gives the most satisfactory operating conditions known to me for the types of operation mentioned. It is well to remember that in the suckling the lumen of the larynx is not parallel with the lumen of the trachea but proceeds in a posterior direction; hence, a tube must not be so large that it will traumatize the lining of the larynx if it becomes necessary to use force to pass the tube through to the trachea. I measure the beveled end of the intratracheal tube, therefore, by placing it over the child's little finger. If the tube fits the nail, it will enter the trachea without difficulty.

Operations on the Nose.—For operations on the nose with the aid of general anesthesia, the use of an intratracheal tube with an inflatable cuff is preferred to use of a tube without a cuff. I also place a wet pack in the patient's throat so that I may catch any débris that may fall into the pharynx from the nose. When the operation is finished, I remove the pack first and then the tube.

I remember a case in which an operation on the nose was being performed; submucous resection of the septum was done. Everything went well until the intratracheal tube was removed, and then it was apparent that the patient could inhale but could not exhale. The reason was that a piece of cartilage from the nose had been carried down into the trachea by inspiration and had lodged there, where it functioned as a flapper valve. On expiration it would be forced up against the vocal cords. Fortunately, the patient coughed up this bit of cartilage and, of course, was then able to breathe satisfactorily.

When a nasal operation is to be performed with the aid of local anesthesia, the surgeon almost always prefers that the patient be in a sitting position in a dental chair. This may result in a situation in which a patient who is unable to tolerate stress begins to perspire and to become chilled. The blood pressure declines, nausea develops and the patient vomits. Such an episode used to be so common that no one was surprised when it occurred. For a time, in the event of such a complication, I would administer ephedrine intravenously, and the blood pressure would increase. Even so, I could not be sure that the patient would feel well enough to be able to cooperate to the extent of sitting up and presenting his nose to the surgeon for the operating procedure. I discovered, however, that the intravenous administra-

tion of 100 mg. of hydrocortisone (solucortef) in 2 cc. of water would produce a salutary effect on the patient, who would become entirely able to cooperate.

The high cost of the hydrocortisone, however, caused me to look for other agents which we might use. I tried wyamine administered intramuscularly and found that it was helpful. Subsequently I employed ritalin in the same way and found it useful.

At length I began to change the medication in other ways, as I have said, using phenergan hydrochloride and levo-dromoran with or without atropine. It seemed to me that I began to encounter a larger number of patients who would be affected by a decrease in blood pressure. In an attempt to counteract such a side effect, in the event that it might be caused by the phenergan hydrochloride, I began to give intramuscularly a 30 mg. dose of either wyamine or ritalin at the same time the preliminary medication was administered. The result is that the problem of a decrease in blood pressure under the circumstances I have described is seldom encountered. If such a situation does develop, a second dose of wyamine or ritalin is given intravenously.

Balanced Anesthesia.—There are some who do not endorse the use of so many drugs in such situations. I am well aware of the objections, but the prime concern must always be to achieve the best possible results for the surgeon. Certainly the patient does not go to the hospital for the anesthesia; he goes for the operation. My purpose is to make operating conditions for the surgeon such that he can obtain the results that will be most favorable for the patient. Thirty years ago I prepared a paper entitled "Balanced Anesthesia." At that time I was convinced that preliminary medication and general anesthesia, perhaps with the addition of local anesthesia, would distribute the burden among several agents rather than concentrate it on a large dose of one agent. Since that time I have had no reason to change my mind. Actually, since the advent of many of the new drugs I have mentioned it has been possible to bring to both patient and surgeon a highly efficient form of balanced anesthesia, such as I advocated years ago.

Control of Postoperative Pain. — The control of postoperative pain is better now than ever before. I shall illustrate this statement by adverting to the condition of pain after hemorrhoidectomy. By application of the new drugs to this operation, all aspects of the procedure have been improved to a highly satisfactory degree. My method is to administer premedication to the patient when he comes to the hospital in the morning. This I do with 25 mg. of phenergan hydrochloride given by mouth when the patient is put to bed. Then, when the patient is called in the afternoon for the operation, I administer 25 mg. of phenergan hydrochloride intramuscularly, with 2 mg. of levo-dromoran.

This procedure considerably improves the status of the patient at the time sacral block anesthesia is induced. Formerly many of these patients would become nauseated and vomit while I was carrying out the block procedure. This happened so frequently that I kept a device for the administration of oxygen at the head of the table, and often it was necessary to administer oxygen to control the nausea and vomiting. Since I have used the preliminary medication in question, no more than 1 in 100 patients is nauseated under such circumstances. This is a genuine improvement.

To control pain in the postoperative period I again administer 25 mg. of phenergan hydrochloride intramuscularly, with 2 mg. of levo-dromoran. I am now able to say that, after all the years of attempts to provide the surgeon with a means for relieving postoperative pain, the objective

has been largely attained. So far as hemorrhoidectomy is concerned, the surgeon can assure his patient that he will not suffer during or after the procedure.

Block Procedures in Diagnosis and Treatment. — In addition to block anesthesia for surgical operations, there has been developed a rather satisfactory technic for diagnostic and therapeutic blocks.[2] When pain itself is the problem, the technic I use is to identify the pain pathway by injecting material that will demonstrate the route either temporarily or semipermanently.[3] For the interruption that is to be of long duration I use either absolute alcohol or a 6 per cent solution of phenol in water. When these agents are to be used I carefully locate the site of the point of the needle by roentgenogram and inject 0.5 cc. at a time until I have injected the quantity required. This I have called the "spot-wetting" technic. When alcohol is used it is important to limit the quantity to the smallest amount that produces the result desired, for if a large quantity is used alcohol neuritis may follow. That is an untoward result and must be avoided if possible.

When chemical sympathectomy is to be done because the patient is regarded as a poor risk for operation, either of the foregoing agents can be used for stellate block[4] of the upper extremity or for lumbar sympathectomy block of the lower extremity. This is an effective means of controlling the pain of the shoulder-arm-hand syndrome in order to permit physiotherapy to be used for rehabilitation. It is even possible to do alcohol lumbar sympathectomy for skin grafting on patients whose circulation is poor. Two or three days after the block has been done a sweating test should be carried out, so that it can be determined whether the sympathectomy was successful. The sweating pattern and the roentgenograms to which I referred earlier make excellent records. The block can be repeated if the sweating pattern fades. If it does not and the symptoms have returned, there is no point in doing another block.

For very brief anesthesia any local anesthetic agent can be used, but it is scarcely convincing or reassuring to the patient to have the relief of pain last for only an hour or two. I have been using a mixture of either 1 or 2 per cent procaine hydrochloride, 2.5 per cent ammonium sulfate and 2 per cent benzyl alcohol. These mixtures have been labeled "PAB_1" or "PAB_2." This mixture assures blocking of nerves for hours or even days, and without the hazard of neuritis. If roentgenograms have been taken of the needles in place and the sweating pattern has been charted, the block can be repeated in any area, provided the roentgenograms and sweating pattern are forwarded to the physician who is to perform the block. The roentgenograms have an added advantage in that they may be shown to the neurosurgeon to demonstrate that specific nerves have been blocked and that he may consider sectioning these nerves.

The Problem of Shock.—The skillful administration of an anesthetic agent is less likely to produce shock than is the indifferent giving of such an agent. In my opinion the anesthetist can contribute something to surgical technic when he is informed by the surgeon just what the surgeon wishes to do. The anesthetist can then make a plan for the particular patient and the particular operation. For example, let us say that a child is to be operated upon for a bilateral congenital condition of the hips. The surgeon would like to operate upon both hips at one session. This, of course, requires more planning than would be necessary for a procedure involving a single hip, and one of the complications that must be guarded against is shock. The anesthetist must prevent shock if he can or treat it if it occurs.

Sometimes shock can be treated prophylactically. For instance, such an operation as the reconstruction of an orbit in a small child may require much time. The plastic surgeon obtains mucous membrane from inside the cheek, preparing it on a round sponge so that the ophthalmic surgeon may then emplace it to form a lining for the socket. This is the first step in a series of operations. Children, however, do not tolerate long operations and long periods of general anesthesia without support, which means that fluids should be administered as soon as the child has been anesthetized.

A number of drugs can be used; stimulants may be given until the shock can be brought under control by the parenteral administration of fluids or other material, such as isotonic solution of sodium chloride or a 5 per cent solution of dextrose in isotonic solution of sodium chloride. A 6 per cent solution of dextran in saline is an excellent plasma-volume expander, or polyvinylpyrrolidone can be used in a 3.5 per cent solution. The use of blood, of course, is very important.

The anesthesiologist has become accustomed to following the patient's blood pressure, pulse rate, respiration and the like, and it has become customary for him not only to administer the anesthetic agent but to maintain the patient in a satisfactory state so far as the prevention of shock is concerned. This allows the surgeon to concentrate on the operation, and it is reasonable to suppose that the operative results will be better if he is not distracted by matters not strictly concerned with surgical technic.

Acute Adrenal Insufficiency During Operation.—New drugs introduced into medical practice may produce remarkable therapeutic effects. On the other hand, they may also create hazards so far as anesthesia and operation are concerned. This was demonstrated as true when cortisone was first used. The irreversible shock during operation upon a patient who had been receiving cortisone preoperatively and then ceased to receive it can easily baffle those who do not have the possibility in mind. When it is known that a patient has been given cortisone, that patient should be prepared for operation by the administration of 100 mg. of cortisone for two or three days before the operation, again on the day of operation and for a day or two afterward. Yet not all operations are elective, and not all patients know that the internist has been giving them cortisone. Naturally, if the patient himself has not been told, he cannot be expected to tell the surgeon about it.

If it is known, however, that this type of support will be needed, the administration of 100 mg. of compound F (hydrocortisone or solu-cortef) dissolved in 2 cc. of water will bring about satisfactory results. Occasionally adrenocortical extract may be needed, but this is rare indeed. I rather anticipate that as additional research uncovers more knowledge about the hormones it may become possible to fortify a patient for any major operation before it is performed. Solu-cortef is a valuable agent in this respect, and, since it cannot harm the patient, it will probably be used increasingly as a fortifying aid to operation.

Hypotension.—The anesthetist, by producing hypotension, can often help the surgeon in certain operations involving extensive hemorrhage. To produce the desired state he administers a drug such as arfonad camphorsulfonate or hexamethonium slowly until the blood pressure decreases to the desired level. This, of course, has helped greatly in certain operations on the brain and certain procedures for aneurysm. Certainly it offers considerable aid in the fenestration operation, and it definitely has improved certain surgical technics.

Hypothermia. — Hypothermia also has been instituted and maintained by the anesthetist. By this means many operations commonly productive of shock have been performed with a reduction in shock. Better and better technics of lowering body temperature have been developed, and the results have inevitably pointed toward one of the anesthesiologist's major objectives: aid to the surgeon in the enhancement of the technical factors of his work.

COMMENT

Space does not permit a lengthy discussion of all the agents and technics that have been developed and have improved surgical technic, but I have mentioned enough of them to emphasize the great distance anesthesia has come in one hundred and ten years. To me the future looks bright indeed. Some of the agents I have mentioned are currently regarded as remarkable improvements, but unquestionably they will themselves be improved upon.

I anticipate the day when it will be possible to terminate anesthesia at will, as readily as it is now induced. Perhaps it will be feasible to use general anesthesia for outpatients, with the assurance that after it has been terminated they will not have to remain in the hospital. It seems to me likely that, as a result of advances in anesthesia in the future, nursing requirements in the hospital will be greatly decreased, since nurses will not have to confine their attention to the patient over long periods for reasons associated with anesthesia and recovery from anesthesia. It may even become possible to use general anesthesia in office practice. Certainly, so far as physicians in general are concerned with treating victims of attempted suicide, the effects of depressant drugs can be combated much more successfully now than was possible three or four years ago. It is very satisfying to me, as an anesthesiologist, to have lived in a period in which so many notable victories have been won over problems which, in the past, were considered hopeless.

SUMMARY

The author describes the progress made in anesthesia during the one hundred and ten years of its existence, with emphasis on the benefits derived from the competent use of modern anesthetic drugs. He considers preoperative medication, including the administration of sedatives, an integral part of anesthesia, which in his opinion includes everything done to build up the patient's tolerance, and to guard against shock, accident or complications, both before and during the actual operative procedure. He emphasizes the importance of the anesthetist's foreknowledge of what the surgeon intends to do, so that the latter need not be distracted during the operation by the necessity of giving directions or explanations with regard to the anesthesia. The anesthetist's responsibility is to aid in the achievement of a good result by planning the operating conditions in such a way as to leave the surgeon's mind entirely free to concentrate on the main task in hand.

The author's preferences with regard to the choice of an anesthetic agent for various operations, including those performed on children, are stated. He considers the picture as a whole extremely encouraging and predicts that it may eventually become possible to terminate anesthesia as quickly and easily as it is now possible to induce it; that the use of general anesthesia in office practice may become feasible, as well as for hospital outpatients, with the assurance that after its termination no hospitalization will be required.

RESUMEN

El autor describe los progresos hechos en anestesia durante los ciento diez años

de existencia de esta, con enfasis en los beneficios derivados del uso competente de las modernas drogas anestesicas El considera la medicacion preoperatoria, incluyendo la administracion de sedantes, una parte integral de la anestesia, la cual en su opinion incluye todo lo hecho para robustecer la tolerancia del paciente y para guardarlo contra shock, accidentes o complicaciones, tanto antes como durante el procedimiento operatorio El enfatiza la importancia del conocimiento del anestesista de lo que el cirujano intenta hacer, para que este no tenga que distraerse durante la operacion dando direcciones y explicaciones respecto a la anestesia La responsabilidad del anestesista es ayudar al logro de un buen resultado planeando las condiciones operatorias de tal modo que la mente del cirujano quede completamente libre para concentrarse en la principal tarea

L a preferencia del autor respecto a la seleccion del agente anestesico para varias operaciones, incluyendo las efectuadas en niños, se establece El considera el cuadro como un todo extremadamente alentador y predice que eventualmente puede llegar a ser posible terminar la anestesia tan pronta y facilmente como es ahora posible inducirla, que el uso de anestesia general en practicas de oficina puede ser posible, asi como para pacientes externos de hospital, con la certeza de que despues de terminada ninguna hospitalizacion sera requerida

RIASSUNTO

L'autore descrive i progressi fatti dall' anestesia nei suoi 110 anni di esistenza e sottolinea i vantaggi derivanti dall'uso dei moderni farmaci anestetici Egli considera la medicazione preoperatoria, e la somministrazione di sedativi, come parte integrante dell'anestesia che—nella sua opinione—comprende qualsiasi cosa fatta per aumentare la tolleranza del paziente, prevenire lo shock, gli accidenti e le complicazioni tanto prima che dopo l'atto operatorio Inoltre egli annette grande importanza al fatto che l'anestesista deve conoscere cio che il chirurgo si appresta a fare, cosicche questo non debba essere distratto durante l'intervento dalla necessita di dare spiegazioni o direttive per cio che concerne l'anestesia La responsabilita dell'anestesista deve essere quella di lasciare la mente del chirurgo libera da qualsiasi altra preoccupazione che non sia quella del paziente che sta operando

L'autore elenca i tipi di anestesia che egli consiglia nelle varie operazioni e per i bambini Egli considera quello che e stato fatto come estremamente incoraggiante e prevede che in futuro sara possibile terminare l'anestesia cosi rapidamente e facilmente come la si induce

SUMARIO

O A descereve o progresso da anestesia durante os cento e dez anos de existência salientando os beneficios advindos do uso judicioso das modernas substâncias anestesicas Cita a pre medicação, incluindo a administração de sedativos, parte integrante da anestesia que na sua opinião inclue os fatores necessarios a aumentar a tolerancia, proteger contra o choque acidentes ou complicações, antes e durante a intervanção cirurgica Salienta a importância de que o anestesista conheça previamente o plano de desenvolvimento de operação, de modo a evitar as interrupçoes do cirurgião para explicações sobre as condições da anestesia durante o ato operatorio A responsabilidade do anestesista e auxiliar no sentido da obtensão de um bom resultado planejando as condições operatorias de tal forma que liberte o operador da preocupação, deixando o plenamente voltado para a execução da tecnica operatoria

O A estabele[illegible]ências par a

escolha dos agentes anestesicos nos diversos tipos de operações, cinluindo as que são praticadas nas crianças. Examina os aspectos atuais da evolução da anestesia com muito otimismo supondo que é possivel até chegar-se a realizar a anestesia tão rapidamente quanto hoje se faz a indução; acredita que a anestesia geral nos conculturios tornar-se-á possivel da mesma forma como nas clínicas de ambulatório dos hospitais com a certeza de que tais narcoses não exigirão hospitalização posterior.

RÉSUMÉ

L'auteur décrit les progrès de l'anesthésie durant les 110 ans de son existence, soulignant les avantages résultant de l'usage compétent des anesthésiques modernes. Il considère les médicaments donnés à la période pré- opératoire, y compris l'administration de sédatifs, comme partie intégrante de l'anesthésie qui, à son avis, inclut toute thérapeutique visant à affermir la tolérance du malade et à le préserver du choc, d'un accident ou de complications, à la fois avant et durant l'opération. L'auteur souligne l'importance pour l'anesthésiste de connaître les intentions du chirurgien afin que ce dernier ne soit pas distrait pendant l'opération par la nécessité de donner des instructions ou des explications concernant l'anesthésie. La responsabilité de l'anesthésiste consiste à préparer des conditions opératoires optimum afin que l'esprit du chirurgien soit entièrement libre de se concentrer sur sa tâche délicate.

L'auteur mentionne les anesthésiques auxquels il donne la préférence pour des opérations variées y compris la chirurgie des enfants. Il considère l'ensemble du tableau comme très encourageant, prévoyant que l'on arrivera peut-être bientôt à terminer une anesthésie aussi rapidement et facilement qu'elle est maintenant obtenue. Il pense aussi que l'utilisation de l'anesthésie générale au cabinet du médecin et à l'hôpital pour les malades ambulatoires pourrait ainsi être envisagée.

ZUSAMMENFASSUNG

Der Verfasser berichtet über die auf dem Gebiete der Narkose in den 110 Jahren ihres Bestehens gemachten Fortschritte unter Hervorhebung der durch fachmännische Anwendung moderner Anaesthetika erzielten Erfolge. Er hält die Arzneiverabreichung vor der Operation einschliesslich der Beruhigungsmittel für einen unabtrennbaren Teil der Narkose und rechnet dazu alles, was geschieht, um die Widerstandskraft des Kranken und seine Wappnung gegen Schock, Unfälle oder Komplikationen vor und während der Operation zu erhöhen. Er hebt hervor, wie wichtig es ist, dass der Narkosearzt mit den Absichten des Chirurgen vertraut ist, sodass dieser während der Operation nicht durch Anordnungen oder Erklärungen hinsichtlich der Narkose abgelenkt zu werden braucht. Es ist die Aufgabe des Narkosearztes, die Operationsbedingungen so zu planen, dass der Chirurg sich ausschliesslich auf sein Werk konzentrieren kann, und auf diese Weise seinen Beitrag zur Erzielung guter Resultate zu leisten.

Der Verfasser gibt an, welche Mittel zur Narkose er bei verschiedenen Operationen einschliesslich solcher an Kindern bevorzugt. Er gibt ein sehr ermutigendes Bild vom Stande der Narkose und prophezeit, dass es schliesslich möglich sein wird, die Narkose ebenso schnell und leicht zu beenden wie man sie zurzeit einleiten kann, und dass sich vielleicht die Allgemeinnarkose in der Sprechstunde oder in Polikliniken ohne die Notwendigkeit anschliessender Krankenhausaufnahme wird durchführen lassen.

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One of the great advantages of being on the staff of a teaching hospital is that the consultant is constantly liable to be subjected to criticism by his colleague, his registrars, house officers, and students We have not allowed, as yet, the development of the teutonic professorial infallibility supported by sycophantic juniors whose only hope of preferment lies in bowing to the pontifical utterances of the great chief We should not allow ourselves to pass from one bed to the next without pronouncing a diagnosis, or saying quite frankly that we do not know If we prove to be wrong we must learn to eat our words and try again, but the words must be recorded by the ward clerk so that there shall be no escape In this way we learn "Experience," wrote Oscar Wilde, "is the name everyone gives to his mistakes"

—A H Douthwaite, Brit M J Oct 20, 1956

Evaluation of Liver Function Tests

HANS POPPER, M.D., Ph.D.

CHICAGO, ILLINOIS

ALTHOUGH functional diagnosis of hepatic disease has been in use for almost half a century and appears of great clinical concern, the practical application of tests of liver function is still poorly established and surrounded by a mystic aura, in contrast to tests of renal, pancreatic and pulmonary function.

Several problems are responsible for these difficulties. First, liver function is extremely complex, in view of the large number of variegated activities which can be related to different hepatic structures. The hepatic epithelial cells are the site of many basic metabolic transformations in what is frequently designated as the metabolic pool. The liver cells also store many metabolites, specifically carbohydrates, fats, proteins and vitamins. These cells secrete substances, such as dextrose, proteins, coagulation factors, and various enzymes, into the blood, and bile acids and pigments into the biliary passages. The liver cells are the site of most detoxifications. The Kupffer cells, the endothelial cells of the hepatic sinusoids, are concerned with breakdown of blood to bile pigments; they are active in phagocytosis and form gamma globulin and antibodies as part of the reticuloendothelial system. The biliary passages are a canalicular drainage apparatus, while the vessels determine hepatic function in that sphincters influence the hepatic blood flow. The liver, as the largest parenchymal organ, determines electrolyte and water balance by its sheer bulk. Moreover, located between the intestine and the heart, it serves as a filter for substances absorbed from the portal system and as a sponge which, by contraction and expansion, regulates the blood volume. Most of these activities have been used in the functional evaluation of hepatic disorders. The bases of innumerable tests, particularly, are the transformations in the metabolic pool. Consideration of its main pathways, however, reveals the difficulties for the nonbiochemist, readily lost in the many side roads, in fully understanding the underlying physiologic picture.

Second, hardly any test in clinical use is based on a function performed only by the liver, and only one so based deserves the designation "liver function test."[1] An example is the response of prothrombin, formed solely by the liver, to the intake of Vitamin K.[2] Although determination of the prothrombin time is one of the most important laboratory procedures in the management of patients with hepatobiliary disease, it is of relatively little assistance in diagnosis. Most of the laboratory procedures used today fail to mirror a specific hepatic function, rather, they reflect biochemical, histologic or hematologic alterations which occur in hepatic or biliary tract diseases, but also, in other conditions. An example are the serum activity of alkaline phosphatase[3] as well as the serum protein reactions (cephalin flocculation[4] and thymol turbidity[5] and the recently developed paper electrophoresis).[6]

The nonspecific nature of such hepatic tests explains the third problem, namely,

From the Hektoen Institute for Medical Research and the Departments of Pathology of Cook County Hospital and Northwestern University Medical School, Chicago, Illinois.

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the large number of false positive results in the absence of hepatobiliary disease.[7] Moreover, with almost all the tests a significant number of false negative results may be obtained in the presence of severe liver disease, since no basic function of the liver is tested but rather nonspecific alterations, which can readily be masked by a varied activity of organs other than the liver.

Fourth, establishment of disturbed hepatic function is seldom an actual clinical problem. In many nonhepatic diseases, for instance in any type of gastrointestinal disorder, pancreatic disease, infections (e.g. tuberculosis and sarcoidosis) or so-called collagen diseases (e.g. rheumatic fever or lupus erythematosis) a nonspecific reactive hepatitis is present[1] which causes abnormal laboratory observations, though involvement of the liver is of little clinical importance. More misleading are the secondary hepatic changes even in uncomplicated biliary obstruction, as reflected histologically, for instance, in feathery degeneration. They lead to disturbances of hepatic cell function in many tests, like that associated with primary cirrhosis or hepatitis.

Fifth, many false teachings are perpetuated. For instance, the ratio of direct (or one minute) to indirect bilirubin does not differentiate extrahepatic biliary obstruction from primary hepatic lesions. Only absence of direct reacting bilirubin implies hemolytic jaundice.

Sixth, even severe anatomic alterations of the liver do not necessarily alter its function, because either the acute process may have given way to a scar or the excellent regeneration characteristic of the liver may mask the injury. Both factors are exemplified in cirrhosis.

Obviously, the clinical use of the hepatic tests requires considerations other than understanding of the physiologic basis of the individual test, such as has rendered such useful information for tests of renal and pancreatic function. The challenge in the laboratory diagnosis of hepatobiliary disease is therefore not so much to the improvement of knowledge on the part of the physiologist, as to the development of a coordinated system (a profile) by the clinician, assisted by the pathologist, who offers correlation with the liver biopsy. On this basis three pathophysiologic responses of the liver can be recognized.

1. *Degeneration of liver cells* indicated by the following evidences:

(a) Serum protein changes, especially reduction of albumin and alpha globulin and elevation of gamma globulin, both demonstrated by abnormal cephalin flocculation and thymol turbidity.

(b) Faulty esterification of cholesterol resulting in a reduced cholesterol ester/total cholesterol ratio;[8]

(c) Disturbed enzymatic activities producing, e.g., reduced serum cholinesterase[9] or transaminase.[10]

(d) Inability to take up urobilinogen reabsorbed from the intestine causing increased urinary urobilinogen.[11]

(e) Impaired glycogen storage reflected in decreased glycogen tolerance.[12]

(f) Faulty detoxification explaining low hippuric acid synthesis.[13]

(g) Impaired dye uptake resulting in increased bromsulfalein retention[14] (of little use in the presence of jaundice).

In view of the possibility of false positive reactions, at least two tests should yield abnormal results before one assumes that liver cell degeneration is present.

2. *Cholestasis* (impairment of bile flow or biliary obstruction) causes the following signs:

(a) Absent or low urinary and/or fecal urobilinogen because of absence of bilirubin from the intestine.

(b) Elevated total serum cholesterol, either from faulty biliary excretion or from excess hepatic formation (or possi-

bly from increased serum solubility caused by an excess solvent).

(c) High serum activity of alkaline phosphatase due either to increased formation or to faulty excretion (increased also in bone diseases, including osseous metastases).

3. *Hepatic inflammation,* reflected in nonspecific reactions, such as (a) elevated serum gamma globulin[15] caused by its excess formation by the Kupffer cells; (b) an elevated erythrocyte sedimentation rate; and (c) high serum mucoproteins.[16]

This grouping of the tests assists in the various clinical problems confronting the surgeon. The most important is the therapeutic differential diagnosis between so-called surgical and medical jaundice. The former comprises the biliary tract diseases potentially amenable to surgery, such as calculi, tumors and strictures, while medical jaundice connotates primary hepatitis and cirrhosis. As a rule of thumb, in the presence of medical jaundice the laboratory evidence of liver cell degeneration exceeds that of cholestasis, while in cases of surgical jaundice cholestasis is in the foreground with liver cell degeneration in the background. When evidence of both exists (for instance, because of liver cell damage complicating biliary obstruction), the results of the flocculation tests are of major importance. Reduction of albumin and alpha-globulin (both produced by the liver cells) occurs in cases of liver cell degeneration either with or without biliary obstruction. In contrast, the excess gamma globulin necessary for a positive reaction and probably produced by the Kupffer cells in response to liver cell damage is not formed in cases of biliary obstruction, probably because the Kupffer cells are blocked by bile pigment. Only if a severe bacterial infection complicates the biliary obstruction do the flocculation tests render abnormal results, presumably because of excess gamma globulin formation outside the liver. Positive results from flocculation tests, therefore, suggest a medical and negative surgical type of jaundice. One exception is severely infected biliary obstruction, which is associated with positive results from flocculation tests but is readily recognized by fever, chills and leukocytosis.[17] Another exception is intrahepatic cholestasis (cholangiolitis or intrahepatic biliary obstruction),[18] in which the clinical and laboratory signs of an extrahepatic biliary obstruction coincide with a perfectly normal biliary tract. The lesion is probably the result of a disturbed permeability of the smallest bile ductules within the liver. It is now rather frequent as a hypersensitivity reaction to various drugs, especially chlorpromazine. As a rule physical and laboratory examination and even biopsy fail to reveal a characteristic difference from extrahepatic biliary obstruction. Sometimes the history provides the answer, but frequently surgical exploration only can supply it. In a patient with all manifestations of obstructive jaundice and a normal extrahepatic biliary tract upon laparotomy, cholangiolitis should be assumed to be present and further surgical intervention on the biliary tract, such as drainage procedures, should be avoided. The only condition with similar features is carcinoma at the bifurcation of the common hepatic duct within the liver.

Another problem confronting the surgeon is that of estimating the degree of liver cell injury in order to predict the course of a known disease, especially in preoperative and postoperative management. Quantitatively the degree of injury is best reflected in the cholesterol ester/total cholesterol ratio and, if the injury is chronic, in the serum albumin level. The cholesterol ratio is especially sensitive with a high level of total cholesterol, as is observed in the surgical patient.[19] Elevation of the nonprotein nitrogen level

is a valuable indication of severe deterioration of the liver, especially in cases of extrahepatic biliary obstruction

Evaluation of the degree and persistence of biliary obstruction is particularly important after an operation on the biliary tract The reduction or absence of urobilinogen in the urine and feces is the most important criterion Although jaundice and elevation of the serum bilirubin level are obvious indications of interference with bile flow, some biliary obstruction may also be present in the absence of of jaundice, especially in cases of postoperative intrahepatic cholangitis This may be reflected in an elevation of the serum alkaline phosphatase level [20]

For diagnosis of the cause of hepatomegaly in the absence of jaundice, liver biopsy is the most effective procedure Increased bromsulfalein retention speaks for hepatic disease but occurs also in cases of passive congestion Of special surgical significance is the demonstration of space-occupying lesions, especially primary and secondary neoplasms, as well as abscesses, including those produced by amebae Alkaline phosphatase activity and bromsulfalein retention are often elevated in the absence of jaundice The flocculation tests are not necessarily helpful

The usual laboratory procedures hardly assist in the differentiation between benign and malignant biliary obstruction In general the cholesterol esters are low in cases of malignant obstruction, but this may also be the case with long protracted or infected benign obstruction Microscopic study for exfoliated tumor cells in duodenal aspirations may be more promising

In conclusion, in the present-day use of hepatic tests in clinical medicine and surgery, the challenge is not so much improvement of the physiologic knowledge of hepatic function, it is, rather, clear formulation of the clinical problem with coordinated use of the available procedures

SUMMARY

The various functions of the liver are enumerated in correlation with the structures responsible for them Only a few of the basic functions performed solely by the liver can be used in the diagnosis of hepatic disease Most of the hepatic tests reflect biochemical, hepatic and biliary tract diseases, as well as other conditions This explains the large number of false positive results of hepatic tests in the absence of hepatobiliary disease In contrast to many other organs, disturbance of he patic function as such is not diagnostic since it can be demonstrated in the presence of any hepatobiliary disease, independent of its nature To avoid confusion therefore, in application of the tests, it appears advantageous to classify them according to their ability to indicate the three basic pathologic responses of the liver demonstrable in biopsy, namely, damage to the liver cells, cholestasis (intrahepatic or extrahepatic) and inflammation

The basis of each test is briefly discussed, and a system for coordinated use of hepatic tests and liver biopsy is recommended for the various problems confronting the surgeon, such as (1) the differentiation of "surgical" from "medical" jaundice, with special emphasis on the distinction between extrahepatic biliary obstruction and intrahepatic cholestasis (cholangiolitis), (2) recognition of the degree of liver cell injury in order to predict the course of the disease, particularly in preoperative and postoperative management, (3) evaluation of the degree of biliary obstruction, especially in the postoperative period, and (4) recognition of hepatic metastases, particularly before surgical intervention

RESUMEN

Las varias funciones del hígado son enumeradas en relación con las estructuras para ellas. Unicamente unas pocas de las funciones básicas desarrolladas por el hígado pueden ser usadas en el diagnóstico de enfermedad hepática.

La mayoría de las pruebas hepáticas reflejan enfermedades bioquímicas, hepáticas y del tracto biliar, tan bien como otras condiciones. Esto explica el gran número de resultados falso positivos de las pruebas hepáticas en la ausencia de enfermedades hepatobiliares. En contraste con muchos otros órganos, disturbio de la función hepática como tal, no es diagnóstico, desde que esto puede ser demostrado en la presencia de cualquier enfermedad hepatobiliar, independiente de su naturaleza. Para evitar confusión, en la aplicación de las pruebas, parece ventajoso clasificarlas de acuerdo con su habilidad para indicar las tres respuestas patológicas básicas del hígado demostrables en biopsia, llamadas, daño a las células del hígado, colestasis intrahepática o extrahepática e inflamación.

Las bases de cada prueba son brevemente discutidas, y un sistema para el coordinado uso de pruebas hepáticas y biopsia del hígado es recomendada para los varios problemas que confronta el cirujano, tales como (1) La diferenciación de ictericia quirúrgica y médica, con especial énfasis en la distinción entre obstrucción biliar extrahepática y colestasis (colangiolitis) intrahepática; (2) Reconocimiento del grado de daño de la célula hepática en orden de predecir el curso de la enfermedad, particularmente en el manejo preoperatorio; (3) Evaluación de obstrucción biliar, especialmente en el período postoperatorio; y (4) Reconocimiento de metastásis hepáticas, antes de la intervención quirúrgica.

RIASSUNTO

Vengono elencate le varie funzioni del fegato e i rapporti di esse con le varie strutture anatomiche. Soltanto poche fra le funzioni epatiche possono venire usate per la diagnosi di malattia del fegato; la maggioranza dei test di funzione epatica riflettono disordini del fegato e della via biliare, come pure altre malattie. Questo spiega il gran numero di false positività delle prove di funzione epatica in assenza di qualunque malattia epatobiliare. A differenza di molti altri organi, i disturbi delle funzioni epatiche non hanno valore diagnostico poichè possono essere presenti in qualunque malattia epatobiliare indipendentemente dalla sua natura. Per evitare confusioni, pertanto, è opportuno classificare queste prove funzionali a seconda della loro capacità a indicare uno dei tre processi patologica fondamentali: la lesione della cellula epatica, la colostasi (intra- o extra-epatica), l'infiammazione.

Vengono elencati, in breve, i vari test e viene proposto un metodo per l'impiego di essi in ognuna delle seguenti circostanze: (1) la differenziazione di un ittero medico da uno chirurgico con particolar riguardo alla distinzione fra ostruzione biliare extra-epatica e colostasi intra-epatica (colangiolite); (2) il riconoscimento del grado di lesione della cellula epatica allo scopo di pronosticare il decorso della malattia e specialmente prima dell'intervento; (3) la valutazione del grado dell'ostruzione biliare, specie nel periodo post-operatorio; (4) il riconoscimento di metastasi epatiche prima dell'operazione.

SUMARIO

Enumera as varias funções hepáticas em correlação com as estruturas responsáveis. Somente poucas funções importantes exercidas isoladamente pelo figado podem ser

examinadas para o diagnóstico das molestias hepaticas Muitas das provas funcionais refletem as doenças do figado, do trato biliar e os disturbios bioquimicos, do mesmo modo como outras afecções Isto explica o grande numero de resultados positivos dos testes funcionais sem que haja molestia hépato-biliar

Em contraste com muitos outros orgãos, os distuibios funcionais do figado não são exclusivos para o diagnóstico, pois que podem existu em presença de qualquei afecção hepato biliar, independente de sua natureza Para evitar tal confusão no emprêgo dos testes parece vantajoso classifica-los de acordo com sua capacidade de indicar as três respostas basicas da patologia do figado, demonstraveis, principalmente, pela biopsia lesão das celulas hepaticas, colesterol (intra- ou extra-hepatico) e inflamação

Discute sucintamente os principios de cada teste, recomenda um sistema para coordenação no emprêgo das provas de função hepatica e da biopsia do figado em face aos varios problemas com que se defronta o cirurgião, tais como 1) a diferênça entre ictericia "cirurgica" e "médica," salientando especialmente a distinção entre obstrução biliar extrahepatica e colestase intra hepatica (colangeolite), 2) reconhecimento do grau de lesão da celula hepatica de modo a prever o curso evolutivo da molestia, particularmente no periodo pre operatorio, 3) avaliação do grau de obstrução biliar, especialmente no posoperatorio, e, 4) diagnostico da existência de metastases hepaticas antes da intervenção cirurgica

ZUSAMMENFASSUNG

Es werden die verschiedenen Funktionen der Leber in Beziehung zu den fur sie verantwortlichen Strukturen aufgezahlt Nur wenige der ausschliesslich von der Leber erfullten Grundfunktionen konnen in der Diagnostik der Lebererkrankungen Verwendung finden Die meisten Leberfunktionsproben sind ein biochemischer Ausdruck von Leber- und Gallengangserkrankungen sowohl als von anderen Storungen Dadurch erklart sich die grosse Anzahl falscher positiver Ergebnisse von Leberfunktionsproben ohne das Bestehen von Leber- oder Gallengangserkrankungen Im Gegensatz zu vielen anderen Organen ist eine Storung der Lebenfunktion als solche nicht von diagnostischem Wert, weil sie bei allen Leber- und Gallengangserkrankungen, welcher Art sie immer sein mogen, nachgewiesen werden kann Um Missverstandnisse bei Anwendung der Funktionsproben zu vermeiden, erscheint eine Klassifizierung nach ihrer Fahigkeit, die drei graundlegenden durch Probeexzision nachweisbaren krankhaften Reaktionen der Leber, namlich Schadigung der Leberzellen, (intra-oder extrahepatische) Gallenstauung und Entzundung, zweckmassig

Die Grundlagen der einzelnen Funktionsproben werden kurz erortert Ferner wird ein System zur Koordinierung der Funktionsproben mit der Probeexzision der Leber empfohlen, mit dessen Hilfe man der Losung der verschiedenen den Chirurgen interessierenden Probleme naher kommen kann Dazu gehoren 1) die Unterscheidung der "chirurgischen" von der "medizinischen" Gelbsucht unter besonderer Beachtung einer Trennung der extrahepatischen Gallengangsverstopfung von der intrahepatischen Gallenstauung (Cholangiohtis), 2) die Erkennung des Grades der Leberzellschadigung im Hinblick auf die Voraussage des Krankheitsverlaufes besonders wahrend der Behandlung vor der Operation, 3) die Abschatzung des Grades der Gallengangsverstopfung besonders nach der Operation und 4) die Erkennung von Lebermetastasen vor einem chirurgischen Eingriff

RÉSUMÉ

Les diverses fonctions du foie sont énumérées en corrélation avec les structures qui en dépendent. Seules quelques-unes des fonctions de base appartenant uniquement au foie peuvent être utilisées dans le diagnostic des affections hépatiques. La plupart des tests hépatiques reflètent des affections du tractus biochimique, hépatique et biliaire, ainsi que d'autres états. Cela explique le grand nombre de faux résultats positifs des tests hépatiques en l'absence d'affections hépatobiliaires. Par opposition à d'autres organes le trouble de la fonction hépatique n'est pas en lui-même un élément de diagnostic puisqu'il peut être démontré en présence d'une affection hépatobiliaire quelconque, indépendante de sa nature. C'est pourquoi, afin d'éviter toute confusion en établissant des tests, il apparaît utile de les classifier selon leurs possibilités d'indiquer les trois réponses pathologiques de base du foie, démonstrables, par la biopsie, soit: lésion des cellules hépatiques, stase biliaire (intra- ou extra-hépatique) et inflammation.

La base de chaque test est brièvement discutée; l'auteur recommande un système pour l'usage coordonné des tests hépatiques et de la biopsie du foie, pour les problèmes variés qui se présentent au chirurgien, tels que 1) différenciation entre una jaunisse "chirurgicale" et une jaunisse "médicale," en insistant sur la distinction entre l'obstruction biliaire extrahépatique et la cholestase intrahépatique (cholangiolite); 2) reconnaissance de l'étendue de la lésion des cellules hépatiques afin de prévoir le cours de la maladie, surtout au stade préopératoire; 3) évaluation du degré d'obstruction biliaire, surtout à la période post-opératoire; 4) reconnaissance des métastases hépatiques, avant l'intervention chirurgicale.

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The indications for postponing a necessary operation fall into two main groups, those in which in the interval the patient will become or can be made more fit to stand the operation, and those in which the local condition will improve or can be improved so that the operation becomes easier or more satisfactory

Of the cases that are admitted to the Casualty Surgical wards of a General Hospital—burns, compound fractures, lacerations, head injuries, run over accidents, and acute abdominal emergencies of every kind—the majority need an early operation, but none except those suffering from intestinal obstruction or uncontrollable haemorrhage need immediate operation The majority are suffering from shock have been vomiting or bleeding, are cold, frightened, and suffering from the effects of the recent catastrophe They must be undressed, washed, and warmed Nearly all are better for some form of resuscitation, varying according to their state from sedation, warmth, and sweet drinks, to transfusion Their illness or injury must be carefully assessed, and the scope and severity of the operation they will require must be determined Most of them should be visited by the anaesthetist A delay of something like four hours will, in the majority of emergencies, allow the surgeon to do a better job on a fitter patient than if he had sent him straight from the reception room to the theatre

—*Ogilvie*

The Genesis of Cardiac Malformations

A NEW THEORY

OLGA M. HARING, M.D.

CHICAGO, ILLINOIS

THE principal causes of death in infants during the first few days of life are malformations of the cardiovascular system and abnormal function of the lungs. After the neonatal period the mortality rate decreases progressively and the incidence of congenital heart disease becomes comparatively low. Correct diagnosis of most of the common types of cardiac malformation after the first year of life can be made on clinical grounds today, and surgical repair, together with proper medical management, cures the disease or alleviates the symptoms in many cases.

Even the most adequate treatment based on accurate diagnosis, however, is not the solution to the problem, and unless a proper method of prevention is devised thousands of infants will die, victims of a disease of unknown cause. The purpose of this paper is to offer a possible explanation of the pathogenesis of cardiac malformations in the hope that better understanding of its mechanism may be a step toward prevention. My theory as to the genesis of cardiac malformation is the result of simple deductive reasoning; its validity has to be confirmed by experimental proofs.

Knowledge of the normal developmental pattern leads to understanding of the abnormal pattern, with the resulting structural aberrations and their effects on the greater and lesser circulations. In the human fetus, by the end of the fourth week, the heart begins its function of pumping blood through the primitive circulatory system. At this time the heart is a simple tube, and the blood that enters at the caudal end passes through in an undivided stream, leaving at the cephalic end. The primitive cardiac tube is firmly anchored at both ends, and this fixation determines the changes it has to undergo in the growing process.

The progressive increase of blood volume, together with the growing number of corpuscles and the pressure of the moving blood mass, exerts an effect on the walls of the heart by constant lateral pressure, longitudinal force and intermittent pulse pressure. These hydrodynamic factors produce localized and generalized changes in the growing heart tube. The local effect is the production of dilatations in the form of the sinus venosus, the atrium, the ventricle and the bulbus. The generalized effect is enlargement of the heart tube as a whole in a longitudinal and transverse direction. Since the heart tube is fixed at both ends, its growth forces it to twist and to bend, constricting the underlying structures. In the areas of localized dilatation, the external constriction causes endocardial folds or ridges to appear on the inner surface, thus initiating septation. The

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septation progresses to complete partition of the heart into four chambers and division of the arterial from the venous circulation By the end of the tenth week the heart assumes its definite structure From this time on until the end of pregnancy, the only appreciable changes in the fetal heart are those in size and muscle pattern, differentiation of cardiac tissue has been completed by then

Occasionally, however, during some phase of development, this perfectly timed and coordinated growth is disturbed Deviation from the normal developmental pattern produces structural changes within the heart or the great vessels Malformations of the cardiovascular system represent mechanical disturbances that interfere, in varying degrees, with normal cardiac function The greater the disturbance, the earlier and more serious the repercussions will be Review of the hemodynamic and clinical aspects of the different types and degrees of cardiac malformation will be the subject of another communication For my purpose at present it is sufficient to state that the severity of repercussions is in proportion to the degree of deviation from the normal anatomic pattern

From autopsies performed on thousands of malformed hearts it appears that the structural abnormalities fall into two well-defined categories The characteristic feature of one type of malformed hearts is that septation has remained uncompleted and there is persistence of fetal communications and passages between the different chambers of the heart and the great vessels In the second type the mechanical disturbance is caused by the abnormal narrowings at some points of the cardiovascular tract, and no defect of septation is present These narrowed passages, which obstruct the normal blood flow, do not represent any previous physiologic stage of fetal life A combination of the two types of malformations, i e , the presence of narrowed passages with persistent fetal communications, is present in the rest of the cases

Enlarged chambers with dilated or overriding vessels are not separate pathologic entities Their presence is only an expression of the degree of interference by the mechanical disturbance with normal cardiac function

The two principal types of cardiac malformation represent clearly two patterns of abnormal growth Persistent fetal communications are an expression of arrested growth, obstructed passages are due to overgrowth Temporary arrest can be followed by a period of overgrowth, or, on the contrary, temporary acceleration can precede local arrest Since the beginning of the century, numerous experiments of Mall, Stockard and others have proved that disturbances of the environment that interfere with the oxygen supply to the young embryo are responsible for a large share of malformations in the mammalian fetus Reduction of oxygen supply to the embryonic tissue decreases metabolic processes, and the rate of growth is diminished or temporarily arrested The earlier the arrest, the more significant the ill effect will be Temporary cessation of growth may be followed by resumption of normal growth, and the aberration in development will depend on the specific stage of organogenesis in which the arrest occurred

If anoxia of the fetal tissues causes arrest by slowing down the metabolic processes and thus produces malformations consisting of persistence of fetal communications, narrowed passages due to an overgrowth of cardiac tissue must be the result of an increased metabolic rate due to increased oxygen supply to the tissue It has been learned that high oxygen concentration retinal prematu sing fibropl ental

by Patz and others, no ocular susceptibility could be detected once the animal had attained retinal vascular maturity. There are no known similar studies on the effect of oxygen on the cardiovascular system, but the similarity of the mechanism is striking.

At first it may seem hard to explain the means by which a mammalian embryo could receive an increased oxygen supply, but this is what may happen: The mammalian fetus draws upon the uterine circulation of the mother for food materials and oxygen to produce the energy necessary for growth. The blood of the embryo contains carbon dioxide and nitrogenous waste products. If the exchange with the maternal uterine circulation is not adequate, a disturbance in development may occur. An increase of the carbon dioxide tension in the fetal blood may have local and generalized effects. With the increase of carbon dioxide more hydrogen ions are liberated; the *p*H of the blood increases, and the intravascular pressure increases also. The uptake of carbon dioxide helps to expel oxygen from the blood and thus increases, at least temporarily and locally, the oxygen supply to the tissue, accelerating metabolism or local growth. Long-lasting or significant increase of carbon dioxide tension would be incompatible with the life of the fetus, but temporary alteration of the gaseous balance during periods of maximal growth can cause significant alterations of the hydrodynamic forces and metabolic processes, producing cardiovascular anomalies.

SUMMARY AND CONCLUSIONS

Malformations of the heart and of the great vessels represent, fundamentally, two patterns of abnormal local development: arrest of growth and overgrowth. Anomalies due to local arrest in growth consist in persistence of fetal communications and passages representing an earlier stage of fetal development. Anomalies due to local overgrowth are abnormal narrowings at some points in the passages of the blood flow. They do not represent any stage of normal fetal development. Periods of local arrest can be preceded or followed by temporary overgrowth to produce the combined cardiac defects.

Arrest of development is caused by anoxia in the fetal tissues, as has been proved by animal experiments. It is postulated that overgrowth is the result of hyperoxygenation of the fetal tissues. A possible mechanism that will temporarily increase the oxygen supply to the cardiac tissues may be an increase of the carbon dioxide level in the blood and a shift of the oxygen dissociation curve to the right.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Den Missbildungen des Herzens und der grossen Gefässe liegen zwei Typen abnormer örtlicher Entwicklung zugrunde, nämlich Stillstand des Wachstums und zu üppiges Wachstum. Die auf örtlichem Wachstumsstillstand beruhenden Anomalien sind diejenigen, bei denen fötale Verbindungswege und Durchgänge aus einer früheren Entwicklungsepoche bestehen bleiben. Auf zu üppigem örtlichem Wachstum beruhende Missbildungen sind unnormale Verengungen an gewissen Punkten des Blutstromkanals. Diese repräsentieren kein im Laufe der normalen fötalen Entwicklung vorkommendes Stadium. Perioden örtlichen Wachstumsstillstandes können einem zeitweiligen zu üppigen Wachstum folgen oder vorangehen und auf diese Weise kombinierte Herzmissbildungen hervorrufen.

Tierexperimente beweisen, dass Entwicklungsstillstand durch Sauerstoffarmut im fötalen Gewebe entsteht. Es ergibt sich die Folgerung, dass zu üppiges Wachstum durch Übersättigung des fötalen Gewebes mit Sauerstoff zustande

kommt. Möglicherweise liegt in der Steigerung des Kohlensäurespiegels im Blut und in der Verschiebung der Dissoziationskurve des Sauerstoffs nach rechts ein Mechanismus, mit dessen Hilfe sich die Sauerstoffzufuhr zum Herzgewebe zeitweilig steigern lässt.

RIASSUNTO

Fondamentalmente le malformazioni del cuore e dei grossi vasi rappresentano due tipi di anormale sviluppo locale: arresto di crescita o crescita eccessiva. Le anomalie dovute all'arresto locale della crescita consistono nella persistenza di comunicazioni e passaggi fetali, che sono presenti nei primi stadi dello sviluppo. Le anomalie dovute ad un eccesso di crescita locale, invece, sono rappresentate da anormali restringimenti al passaggio della corrente sanguigna. Esse non rappresentano alcuno stadio dello sviluppo fetale normale. Periodi di arresto locale possono essere preceduti o seguiti da periodi passeggeri di sviluppo eccessivo, e ciò spiega la anomalie cardiache combinate.

L'arresto di sviluppo è conseguenza di un'anossia dei tessuti fetali, e ciò è stato dimostrato da esperimenti sugli animali. Si è formulata l'ipotesi che l'eccesso di sviluppo sia dovuto, invece, ad una iperossigenazione dei tessuti fetali. Una causa possibile di iperossigenazione dei tessuti cardiaci può essere rappresentata da un aumento dell'anidride carbonica del sangue che sposta a destra la curva di dissociazione dell'ossigeno.

RESUMEN Y CONCLUSIONES

Las malformaciones del corazón y de los grandes vasos representan fundamentalmente dos patrones de desarrollo local anormal: detención del desarrollo y sobre desarrollo. Las anomalías debidas a detención local en el desarrollo consisten en persistencia de comunicaciones y pasajes fetales que representan un estado temprano del desarrollo fetal. Las anomalías debidas a sobre desarrollo local son estrecheces anormales en ciertos puntos de los pasajes sanguíneos. Estos no representan ningún estado de desarrollo fetal normal. Períodos de detención de desarrollo pueden ser precedidos o seguidos por sobre desarrollos temporales para producir los defectos cardíacos combinados.

La detención de desarrollo es causada por anoxia en los tejidos fetales, como ha sido probado por experimentos en animales. Se ha postulado que el sobre desarrollo es el resultado de la sobre oxigenación de los tejidos fetales. Un posible mecanismo que puede aumentar temporalmente el suplemento de oxígeno a los tejidos cardíacos puede ser un aumento del nivel de bióxido de carbono en la sangre y un cambio de la curva de disociación del oxígeno hacia la derecha.

SUMARIO E CONCLUSOES

A máformação do coração e dos grandes vasos representa, fundamentalmente, dois tipos de sesenvolvimento anormal: parada de crescimento e hiperdesenvolvimento. As anomalias dependentes da parada de crescimento consistem na persistência da comunicações fetais e das falhas que representam um estadio precoce do desenvolvimento fetal. As dependentes do hipercrescimento local se apresentam como estenoses em alguns pontos de passagem da corrente sanguínea. Períodos de parada de desenvolvimento podem ser precedidos ou seguidos por hipercrescimento temporário produzindo os tipos de defeitos cardiacos combinados.

O tipo de parada de desenvolvimento é causado por anoxia nos tecidos fetais como demonstram as experiências em animais de laboratório. Está estabelecido que o hiperdesenvolvimento é o resultado da hiperoxigenação dos tecidos fetais. Um mecanismo possivel que venha provocar

um aumento temporário da oxigenação dos tecidos cardiacos pode ser representado pelo acrescimo de anhidrido carbônico no sangue e um desvio da curva de dissociação do oxigênio para a direita.

RÉSUMÉ ET CONCLUSIONS

Les vices du coeur et des grands vaisseaux représentent deux types de développement local anormal: arrêt de la croissance et hypertrophie. Les anomalies dues à l'arrêt local de croissance consistent en la persistance des communications et passages foetaux représentant un stade antérieur du développement foetal. Les anomalies dues à l'hypertrophie local sont des rétrécissements anormaux localisés entravant la circulation sanguine. Il ne s'agit nullement d'un stade de développement foetal normal. Des périodes d'arrêt local peuvent être précédées ou suivies d'hypertrophie temporaire produisant les vices cardiaques combinés.

L'arrêt du développement est causé par une anoxie dans les tissus foetaux comme l'ont prouvé des expériences sur l'animal. Il est considéré que l'hypertrophie est le résultat de l'hyperoxygénation temporaire des tissus cardiaques peut être produit par une augmentation du niveau d'acide carbonique dans le sang et une déviation à droite de la courbe de dissociation de l'oxygène.

And he will manage the cure best who has foreseen what is to happen from the present state of matters. For it is impossible to make all the sick well; and this indeed would have been better than to be able to foretell what is going to happen; but since men die. some even before calling the physician, from the violence of the disease. and some die immediately after calling him. having lived. perhaps only a day or a little longer. and before the physician could bring his art to counteract the disease: it therefore becomes necessary to know the nature of such affections, how far they are above the power of the constitution; and, moreover, if there be anything divine in the diseases. and learn a foreknowledge of this also. Thus a man will be the more esteemed to be a good physician. for he will be better able to treat those aright who can be saved. from having long anticipated everything; and by seeing and announcing beforehand those who will live and those who will die, he will thus escape censure.

—*Hippocrates*

Observations on the Urinary Tract Two to Eight Years After Complete or Anterior Pelvic Exenteration

W DANIEL, M D, D A B
AND
A BRUNSCHWIG, M S, M D, F A C S, F I C S
NEW YORK CITY, NEW YORK

LONG survival following removal of all or part of the pelvic viscera for advanced carcinoma is observed with increasing frequency throughout the world Success depends, first of all, upon removal of all the cancer, and then upon a method of diversion of urine that will have a low immediate morbidity rate and be compatible with long survival Up to the time of writing a proper urologic evaluation has been impossible, owing to the relatively small number of patients who survive the operation and the carcinoma

The survival of 64 patients for periods varying from two to nearly nine years has afforded us an opportunity to observe the altered urinary tract after pelvic exenteration It should be remembered that this is an initial report of the first large series of cases in which this type of radical operation was employed We hope this analysis will help both us and others to improve the future management of diversion of the urine

From September 1947 until January 1956, complete or anterior pelvic exenterations were performed on 441 patients of the Gynecological Service at Memorial Center for advanced carcinoma—mostly carcinoma of the cervix (Table 1) The various types of diversion of urine are outlined in Table 2 They consisted of (a) implantation of both ureters above an end colostomy—called a wet colostomy—in those cases in which complete pelvic exenteration was performed, (b) implantation of both ureters into the intact pelvic portion of the colon in cases of anterior pelvic exenteration, and (c) bilateral cutaneous ureterostomy in some instances of both the complete and the anterior pelvic exenteration

The preferred and recommended method of diversion is the implantation of both ureters into either an end colostomy (wet colostomy) or into the intact pelvic colon for patients on whom anterior pelvic exenteration is performed Most of the 64 cutaneous transplants were performed prior to 1954, on patients in poor physical condition on the operating table or patients with impaired renal function Nearly all of the 21 ileal bladder procedures have been performed in the past two years

The technic of ureterosigmoid anasto-

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TABLE 1.—*Data on All Pelvic Exenterations Performed in Gynecologic Service, Memorial Center, September 1947-January 1956*

Diagnosis	No. of Cases
Carcinoma of cervix uteri	336
Carcinoma of corpus uteri	32
Carcinoma of vulva	21
Carcinoma of rectum	17
Carcinoma of vagina	10
Sarcoma of uterus	10
Carcinoma of ovary	10
Other lesions	5
Total	441

mosis has been uniform. It consists of making a simple small circular opening into the intestine, through which the previously slit ureter is brought for a distance of 2 to 5 cm. and anchored with a single silk suture. The bowel wall is approximated loosely to the periureteral tissues with four or five fine chromic sutures, and a patch of overlying peritoneum is used to anchor and seal this anastomosis (Fig. 1).

The deaths due to urinary complications are listed in Table 3, according to the method employed for diversion of the urine. Deaths among patients who underwent transplantation of the ureters into an intact colon (anterior pelvic exenteration) numbered 15, or 11.9 per cent of the total, as compared to 8, or 4.5 per cent, of those for whom wet colostomy was employed. Of the 7 cases under the heading "Other," implantation of one ureter in the sigmoid and one in the cecum was done in 3; transplantation of one ureter to the sigmoid plus nephrectomy in 2, and ligation

TABLE 2.—*Method of Diverting Urine in Four Hundred and Forty-One Cases of Pelvic Exenteration, Memorial Center, September 1947-January 1956*

	Complete Exenteration	Anterior Exenteration	No. of Cases
Sigmoid	177	126	303
Skin	50	14	64
Ileal bladder	14	7	21
Other*	28	9	37
Deaths in operating room	13	3	16
Total	282	159	441

*This includes:
1 ureter in sigmoid, 1 ligated (9 cases)
1 ureter in sigmoid, 1 in cecum (12 cases)
1 ureter in sigmoid and nephrectomy (9 cases)
Rectal pouch (1 case)
Sigmoid pouch (2 cases)
Cecal pouch (1 case)
1 ureter in sigmoid, 1 in skin (1 case)
1 ureter in skin and 1 ligated (2 cases)

TABLE 3.—*Deaths Due to Urinary Complications, Listed by Type of Diversions of Urine, in Four Hundred and Forty-One Cases of Pelvic Exenteration, Memorial Center, September 1947-January 1956*

Interval	Sigmoid		Skin		Ileal Bladder		Other		Total		All
	A.	C.	A.	C.	A.	C.	A.	C.	A.	C.	
Operative deaths*	4	3	0	2	0	1	1	2	5	8	13
1 to 6 mo.	7	4	0	2	0	1	1	2	8	9	17
6 to 12 mo.	2	1	0	0	0	0	0	0	2	1	3
1 to 2 yrs.	1	0	0	0	0	0	0	0	1	0	1
2 to 3 yrs.	0	0	0	0	0	0	1	0	1	0	1
3 to 4 yrs.	1	0	0	0	0	0	0	0	1	0	1
All	15	8	0	4	0	2	3	4	18	18	36

*Death within 30 days
A., anterior exenteration
C., complete exenteration

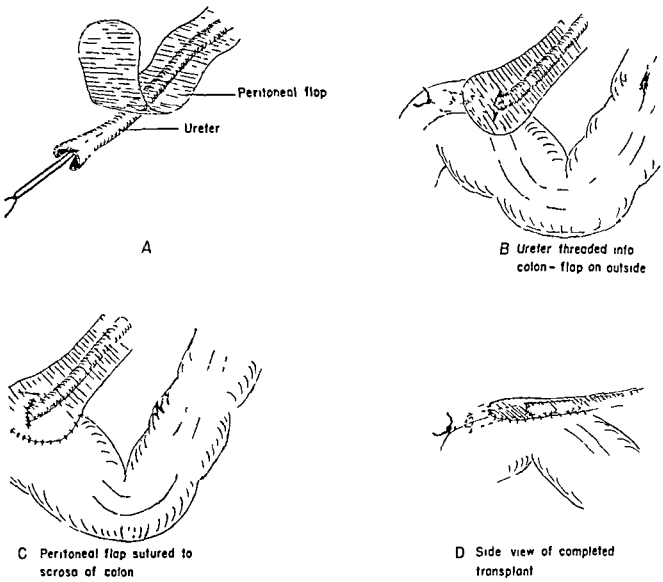

Fig. 1.—Technic for transplantation.

of one ureter and transplantation of the other to the sigmoid in 1. In these cases the disease was more advanced than in the other group; more damage to the urinary tract, therefore, was present.

As of Sept. 1, 1956, 64 patients living after two to ten years, or dead after two to seven years without carcinoma, were available for study (Table 4). Four other patients were living but are not included here because of the inadequacy of the urologic follow-up.

Evaluation of the status of the urinary tract is based on three principal factors: (1) the history since the operation with regard to adjustments to the altered urinary tract, attacks of pyelonephritis, symptoms of hyperchloremic acidosis, the need for sodium bicarbonate and the ability to resume practically normal physical activities; (2) the roentgenographic ap-

TABLE 4.—*Sixty-Four Cases of Pelvic Exenteration, Patients Living Two to Eight Years or Dead Without Carcinoma Two to Seven Years,* Memorial Center, October 1947-September 1954*

Type of Diversion of Urine	*Anterior Exenteration*	*Complete Exenteration*	*No. of Cases*
Sigmoid	23**	31†	54
Cutaneous	2	6	8
Ileal bladder	0	2	2
Total	25	39	64

*4 living patients are not included (no data).
**In 1 case a ureter was ligated because of nonfunction.
†1 patient is living after ureter in the cecum and sigmo nephrectomy.

TABLE [illegible]—Summary of Complete Pelvic Exenterations with Wet Colostomies

	Patient	Operation	Result	Postoperative Course	Bacteriuria	Renal Function	Pyelograms	R	L
1	M.C., 56, recurrent carcinoma of cervix	Complete pelvic exenteration, wet colostomy, ureteroileocystostomy	Living 8 yr. 10 mo.	No pyelitis	Chemical	BUN 17 Cl 120 CO_2 9	Preoperative Postoperative 7 yr. 5 mo.	0 2	0 3
2	C.W., 46, recurrent carcinoma of cervix Class IIB	Complete pelvic exenteration, wet colostomy	Living 8 yr. 6 mo.	No pyelitis	No	BUN 21 Cl 115 CO_2 22	Preoperative Postoperative 8 yr. 6 mo.	0 2	0 1
3	C.R., 56, recurrent carcinoma of cervix Class IIB	Complete pelvic exenteration, wet colostomy	Living 8 yr. 7 mo.	1 attack of pyelitis	No	BUN 17 Cl 111 CO_2 24	Preoperative Postoperative 3 year 7 yr. 10 mo.	0 1 1	0 2 3
4	J.M., 59, recurrent carcinoma of cervix Class IIB	Complete pelvic exenteration, wet colostomy, right nephrectomy	Living 7 yr. 8 mo.	No pyelitis	Chemical	BUN 15 Cl 124 CO_2 16	Preoperative Postoperative 1 yr. 7 yr. 3 mo.	1 	0 3 2
5	M.B., 70, radiation necrosis of pelvic viscera	Complete pelvic exenteration, wet colostomy	Dead 7 yr. 8 mo.	No pyelitis, dead of complication following operation for mechanical obstruction; no carcinoma	No	BUN 72 Cl 104 CO_2 22	Preoperative Postoperative 7 yr. 3 mo.	0 0	0 1
6	F.C., 35, recurrent carcinoma of cervix Class IIB	Complete pelvic exenteration; wet colostomy	Living 7 yr. 1 mo.	No pyelitis	No	BUN 28.8 Cl 109 CO_2 28	Preoperative Postoperative 2 yr. 7 mo. 5 yr. 11 mo.	0 2 1	0 3 2
7	R.B.; 61; recurrent carcinoma of corpus uteri	Complete pelvic exenteration; wet colostomy	Living 6 yr. 9 mo.	1 attack of pyelitis	No	BUN 18 Cl 111 CO_2 23	Preoperative Postoperative 1 yr. 9 mo. 6 yr. 6 mo.	0 2 3	0 2 2
8	H.W.; 39; radiation necrosis of pelvic viscera	Complete pelvic exenteration, wet colostomy	Living 6 yr. 9 mo.	No pyelitis	No	BUN 19 Cl 113 CO_2 22	Preoperative Postoperative 9 mo. 5 year	0 1 1	0 3 0
9	J.B.; 58; carcinoma of rectum	Complete pelvic exenteration; wet colostomy; cutaneous ureterostomy 10 mo. later dermoid & tubes	Living 6 yr. 8 mo.	No pyelitis	No	BUN 11.5 Cl 110 CO_2 26	Preoperative Postoperative 6 yr. 6 mo.	0 1	0 0

10	L C 60, recurrent carcinoma of cervix Class RE	Complete pelvic exenteration, wet colostomy	Living 5 yr 11 mo	No pyelitis	No	BUN 20 9 Cl 112 CO_2 23	Preoperative Postoperative 5 yr 6 mo	0 1	0 1
11	B B, 44, carcinoma of vagina with involvement of bladder	Complete pelvic exenteration, wet colostomy	Living 5 yr 7 mo	No pyelitis	No	BUN 9 6 Cl 112 CO_2 20	Preoperative Postoperative 4 yr 5 yr 1 mo	1 2 2	0 2 2
12	E D 53, radiation necrosis of pelvic viscera	Complete pelvic exenteration wet colostomy	Dead 5 yr 2 mo	Two attacks of pyelitis, dead after operation for small intestinal fistula, no carcinoma	No	NPN 46 Cl 110 CO_2 25	Preoperative Postoperative 1 yr 4 yr	0 1 2	0 —1 1
13	C M, 46, recurrent carcinoma of cervix Class RB	Complete pelvic exenteration, wet colostomy	Living 5 yr		No	BUN 16 6 Cl 115 CO_2 22	Preoperative Postoperative 4 yr 4 mo	0 2	0 1
14	P M 60 carcinoma of rectum	Complete pelvic exenteration, wet colostomy	Living 4 yr 11 mo	2 attacks of pyelitis	No	BUN Cl CO_2 24	Preoperative Postoperative 4 yr 1 mo	 2	 3
15	L T 31 recurrent carcinoma of cervix Class SE	Complete pelvic exenteration wet colostomy	Living 4 yr 11 mo	No pyelitis	No	BUN 16 8 Cl 110 CO_2 22	Preoperative Postoperative 4 yr 3 mo	0 3	0 2
16	L W, 62, recurrent carcinoma of vulva	Complete pelvic exenteration wet colostomy	Living 4 yr 10 mo	No pyelitis	No	BUN 15 Cl 106 CO_2 19 7	Preoperative Postoperative 4 yr 4 mo	 3	 2
17	V B 49 recurrent carcinoma of cervix Class SRE	Complete pelvic exenteration wet colostomy	Living 4 yr 8 mo	No pyelitis	No	BUN 13 Cl CO_2	Preoperative Postoperative 3 yr 4 mo	0 0	0 1
18	E H 41 recurrent carcinoma of cervix Class SE	Complete pelvic exenteration wet colostomy	Living 4 yr 7 mo	1 attack of pyelitis	No	BUN 9 2 Cl 109 CO_2 24	Preoperative Postoperative 4 yr 3 mo	0 2	0 1
19	J C 14, recurrent carcinoma of cervix Class Pr F	Complete pelvic exenteration wet colostomy	Living 4 yr 2 mo	No pyelitis	No	BUN Cl CO_2	Preoperative Postoperative 4 yr 2 mo	 0	 1
20	G H 52 recurrent carcinoma of cervix Class RF	Complete pelvic exenteration wet colostomy	Living 4 yr	No pyelitis	No	BUN 16 7 Cl 115 CO 25	Preoperative Postoperative 2 yr 9 mo	0 1	0 1

Continued on next page

TABLE 5 (Continued).—*Summary of Complete Pelvic Exenteration with Wet Colostomies*

	Patient; Age; Diagnosis	Operation	Survival	Postoperative Course	Hyperchloremic Acidosis	Last Blood Chemical Values	Pyelograms	R	L
21.	E.K.; 53; recurrent carcinoma of cervix Class RE	Complete pelvic exenteration; wet colostomy	Dead 3 yr. 6 mo.	No pyelitis; death from overdose of barbiturates	Unknown	BUN 16	Preoperative Postoperative 2 yr. 8 mo.	.. 2	.. 4
22.	S.P.; 44; recurrent carcinoma of cervix Class RE	Complete pelvic exenteration; wet colostomy	Living 3 yr. 5 mo.	No pyelitis	No	BUN 26 Cl 560 CO_2	Preoperative Postoperative 2 yr.	.. 3	.. 3
23.	R.H.; 31; recurrent carcinoma of cervix Class REN	Complete pelvic exenteration; wet colostomy	Living 3 yr. 3 mo.	Urinary fistula with resulting nonfunction of left kidney; no pyelitis	Chemical	BUN 21 Cl 105 CO_2 27	Preoperative Postoperative 3 yr.	0 1	0 4
24.	J.S.; 21; mixed mesodermal sarcoma	Complete pelvic exenteration; wet colostomy	Living 2 yr. 11 mo.	No pyelitis	No	BUN .... Cl ... CO_2 ..	Preoperative Postoperative 1 yr. 6 mo.	0 0	0 3
25.	G.McI.; 44; carcinoma of vagina	Complete pelvic exenteration; wet colostomy	Living 2 yr. 9 mo.	No pyelitis	No	BUN 17.3 Cl 110 CO_2 28	Preoperative Postoperative 2 yr. 9 mo.	1 1	0 0
26.	E.M.; 44; carcinoma of cervix Class L of N III	Complete pelvic exenteration; wet colostomy	Living 2 yr. 6 mo.	No pyelitis	No	BUN 8 Cl 110 CO_2 22	Preoperative Postoperative 2 yr. 5 mo.	0 1	1 0
27.	V.K.; 47; recurrent carcinoma of cervix Class SRE	Complete pelvic exenteration; wet colostomy	Living 2 yr. 5 mo.	No pyelitis	No	BUN 16.5 Cl 114 CO_2 23	Preoperative Postoperative 1 yr. 10 mo.	0 0	0 2
28.	D.J.; 57; recurrent carcinoma of corpus uteri	Complete pelvic exenteration; wet colostomy	Living 2 yr. 4 mo.	No pyelitis	No	BUN 13 Cl 105 CO_2 25	Preoperative Postoperative 2 yr. 4 mo.	0 0	0 1
29.	P.R.; 54; recurrent carcinoma of cervix Class RF	Complete pelvic exenteration; wet colostomy	Living 2 yr. 4 mo.	No pyelitis	No	BUN 10 Cl 109 CO_2 24	Preoperative Postoperative 2 yr. 3 mo.	2 3	0 0
30.	J.B.; 63; recurrent carcinoma of cervix Class SE	Complete pelvic exenteration; wet colostomy	Living 2 yr.	No pyelitis	No	BUN 17.6 Cl 106 CO_2 25	Preoperative Postoperative 1 yr. 1 mo.	0 1	0 4
31.	L.K.; 51; recurrent carcinoma of cervix Class RF	Complete pelvic exenteration; wet colostomy	Living 2 yr.	No pyelitis	No	BUN 5.1 Cl 111 CO_2 —22	Preoperative Postoperative 2 yr.	0 1	0 0

pearance of the urinary tract (intravenous pyelograms), and (3) renal function as reflected in blood chemical values and, more recently, clearance studies in a few instances Chemical tests of the blood also reveal the presence of hyperchloremic acidosis, which is diagnosed when the chloride level is above 110 milliequivalents and the carbon dioxide level below 20 milliequivalents on more than one occasion In the absence of symptoms this is called chemical hyperchloremic acidosis This condition is symptomatic, with manifestations ranging from mild weakness and nausea to severe vomiting and coma In most instances this becomes "controlled hyperchloremic acidosis" after the administration of bicarbonate of soda The scheme for evaluating pyelograms is as follows Stage O, normal pyelogram, Stage I, slight dilatation of ureters and calyces, Stage II, unquestioned dilatation of ureters and calyces, but preservation of calyceal cupping, Stage III, appreciable dilatation of the ureters and calyces with absence of cupping in the latter, and their appearance as rounded masses, and Stage IV, nonvisualization of the collecting system This scheme does not take into consideration the degrees of function, as shown by dye concentration, except in the absence of visualization (Stage IV) Usually diminishing function parallels the degree of hydronephrosis

Table 5 summarizes the data on patients who were treated by complete pelvic exenteration and implantation of the ureters above an end colostomy (wet colostomy) The urologic results in these 31 cases of wet colostomy, in our opinion, have been quite satisfactory, and are outlined in Table 6 for comparison with those of anterior exenteration There have been no deaths from uremia secondary to progressive hydronephrosis in this group of two-year survivors—in fact, there have been no deaths from this cause in patients who

TABLE 6.—*Complete and Anterior Pelvic Exenterations with Ureterointestinal Transplantation of the Ureters in Fifty Four Cases Patients Living Two to Eight Years or Dead without Carcinoma Two to Five Years, Memorial Center, October 1947 September 1954*

	*Anterior Exenteration (*3 Patients)*	*Complete Exenteration (51 Patients)*
Loss of function (IVP) single kidney	3	3
Loss of function (IVP), both kidneys	2	0
Late pyelonephritis	9	5
Hyperchloremic acidosis	15	3
Chemical only	(4)	(3)
Clinical	(8)	(0)
Coma	(3)	(0)
Calculi	3	0
Further diversion of urine	3	1**
Death from uremia	2	0

*For intestinal fistula
3 patients living more than 5 years not included (no data)
Effective date of study, Sept 1, 1956

survived one year Although 3 of this group did show blood chemical values compatible with hyperchloremic acidosis, there were no cases in which symptoms of this condition appeared and no patients who required soda Only 5 patients had pyelonephritis after discharge from the hospital, and in each instance this was easily controlled with antibiotics Loss of renal function was minimal, and only 3 patients lost the function of a single kidney The one colostomy is easy to manage, and the newer apparatuses, which are easily deodorized, can be left on for as long as two weeks They are compatible with comfort and full activity (Fig 2) * In no instance was it necessary to divert the urine because of obstruction The ureters were transplanted to the skin in 1 case, that of J B, because of large intestinal fistulas distal to the anastomosis

*Perma Type bag Eastern Sales Company West Hartford Connecticut

TABLE 7.—*Summary of Anterior Pelvic Exenterations with Ureters in Sigmoid*

Patient; Age; Diagnosis	Operation	Survival	Postoperative Course	Hyperchloremic Acidosis	Last Blood Chemical Values		Pyelograms	R	L
1. T.G.; 31; recurrent carcinoma of cervical stump Class RE	Anterior pelvic exenteration	Living 8 yr. 9 mo.	Many attacks of pyelitis; calculus right kidney; never alkali	No	BUN Cl CO_2	13 112 23	Preoperative Postoperative 3 yr. 6 mo. 8 yr. 9 mo.	0 0 4	0 0 1
2. Z.A.; 65; carcinoma of cervix L of N III	Anterior pelvic exenteration	Living 7 yr. 11 mo.	Calculus of right kidney; no pyelitis; never alkali	No	BUN Cl CO_2	15 106 24	Preoperative Postoperative 7 yr. 11 mo.	0 4	0 1
3. Y.F.; 47; carcinoma of cervix Class RC	Anterior pelvic exenteration	Living 6 yr. 2 mo.	No pyelitis	Clinical; mild	BUN Cl CO_2	21.3 116 19	Preoperative Postoperative 4 yr. 4 mo.	0 1	0 1
4. A.D.; 49; recurrent carcinoma of cervix Class RC	Anterior pelvic exenteration; ureters transplanted to skin for progressive hydronephrosis; PO—11 mo.	Living 5 yr. 11 mo.	Calculus of right kidney; 2 attacks of pyelitis	No	BUN Cl CO_2	56 113 24	Preoperative Postoperative 5 yr. 2 mo.	0 4	0 4
5. L.S.; 63; adenoma of corpus uteri	Anterior pelvic exenteration	Living 5 yr. 8 mo.	No pyelitis; never alkali	No	BUN Cl CO_2	21.4 555 ..	Preoperative Postoperative 4 yr.	.. 1	.. 1
6. M.M.; 60; carcinoma of vulva	Anterior pelvic exenteration	Living 5 yr. 4 mo.	No pyelitis; Never alkali	No	BUN Cl CO_2	14 115 21	Preoperative Postoperative 3 yr. 8 mo.	.. 3	. 2
7. M.P.; 48; carcinoma of cervix L of N III	Anterior pelvic exenteration	Living 5 yr. 3 mo.	No pyelitis	Clinical; mild	BUN Cl CO_2	13 122 18	Preoperative Postoperative 5 yr.	0 0	0 0
8. C.B.; 47; carcinoma of cervix —EN L of N IV	Anterior pelvic exenteration	Dead 5 yr. 1 mo.	Died of coronary occlusion; 2 attacks of pyelitis	Clinical; moderate	BUN Cl CO_2	26 112 20	Preoperative Postoperative 2 yr. 6 mo. 4 yr. 3 mo.	0 3 3	0 2 3
9. L.J.; 51; carcinoma of cervix L of N IV	Anterior pelvic exenteration	Living 4 yr. 7 mo.	Many attacks of pyelitis	Clinical; moderate	BUN Cl CO_2	12 115 22	Preoperative Postoperative 2 yr. 5 mo.	0 4	0 0
10. M.B.; 67; carcinoma of cervical stump L of N II	Anterior pelvic exenteration	Living 4 yr. 5 mo.	1 attack of pyelitis	Clinical; mild	BUN Cl CO_2	29 114 18	Preoperative Postoperative 4 yr. 5 mo.	0 2	2 3
11. M.T.; 57; recurrent carcinoma of cervix Class SRF	Anterior pelvic exenteration	Living 3 yr. 9 mo.	3 attacks of pyelitis	Clinical; moderate	BUN Cl CO_2	22 114 27	Preoperative Postoperative	0 2	1 2

12	E McN, 34, carcinoma of cervix L of N III	Anterior pelvic exenteration	Living 3 yr 8 mo	No pyelitis	?	BUN Cl CO_2	23 113 24	Preoperative Postoperative 3 yr 7 mo	0 0	0 0
13	E B, 33, carcinoma of cervix L of N II	Anterior pelvic exenteration, ileal bladder for progressive hydronephrosis PO—3 yr 3 mo	Living 3 yr 7 mo	3 attacks of pyelitis	Clinical, severe	BUN Cl CO	15 113 19	Preoperative Postoperative 3 yr 4 mo	0 3	0 2
14	A A, 47 carcinoma of bladder	Anterior pelvic exenteration	Dead 3 yr 5 mo	Died in uremia, 2 attacks of pyelitis	Clinical, moderate	BUN Cl CO	65 114 12	Preoperative Postoperative 2 yr 9 mo	4 4	0 4
15	L D, 62, recurrent carcinoma of cervix Class RF	Anterior pelvic exenteration	Living 3 yr with lymphosarcoma	No pyelitis	No	BUN Cl CO_2	12 104 26	Preoperative Postoperative 2 yr 11 mo	0 2	0 2
16	E M, 52 recurrent carcinoma of cervix Class RC	Anterior pelvic exenteration, bilateral nephrostomy for progressive hydronephrosis PO—2 yr	Living 3 yr	Many attacks of pyelitis	Clinical, moderate	BUN Cl CO_2	35 108 27	Preoperative Postoperative 2 yr 2 yr 2 mo	0 3 2	0 3 2
17	S H, 68, recurrent carcinoma of cervix Class RF	Anterior pelvic exenteration, left ureter ligated	Dead 2 yr 10 mo	Dead from uremia	No	BUN Cl CO_2	17 105 22	Preoperative 2 yr 6 mo	0 3	4
18	A McE, 48, carcinoma of cervix L of N IV	Anterior pelvic exenteration	Living 2 yr 10 mo	No pyelitis	No	BUN Cl CO_2	20 118 17	Preoperative Postoperative 2 yr 10 mo	0 1	0 1
19	K D, 51 recurrent carcinoma of cervix Class SE	Anterior pelvic exenteration	Living 2 yr 8 mo	No pyelitis	Clinical, severe	BUN Cl CO_2	22 101 23 8	Preoperative Postoperative 2 yr 3 mo	0 1	0 2
20	R E, 37, recurrent carcinoma of cervix Class SF	Anterior pelvic exenteration	Living 2 yr 3 mo	No pyelitis	Chemical	BUN Cl CO_2	13 5 111 18	Preoperative Postoperative 2 yr 2 mo	0 1	0 0
21	H B, 60 recurrent carcinoma of corpus uteri	Anterior pelvic exenteration	Living 2 yr 2 mo	No pyelitis	Clinical, severe	BUN Cl CO	29 115 18	Preoperative Postoperative 6 mo 1 yr 6 mo	0 1 0	0 2 1
	S W, 54 carcinoma of cervix L of N II	Anterior pelvic exenteration	Living 2 yr 2 mo	No pyelitis	No	BUN Cl CO	7 4 112 24	Preoperative Postoperative 2 yr	0 1	0 1
	J B, 62, carcinoma of cervix L of N II	Anterior pelvic exenteration	Living 2 yr 1 mo	No pyelitis	Chemical	BUN Cl CO	24 116 18	Preoperative Postoperative 1 yr 3 mo	0 2	0 3

TABLE 8.—*Evaluation of Most Recent Pyelogram in Fifty-Four Cases of Pelvic Exenteration with Intestinal Diversion of Urine (Memorial Center)*

	Anterior Exenteration (23 Patients)	Complete Exenteration (31 Patients)
0 — Normal	7	13
1+ — Slight hydronephrosis	13	20
2+ — Moderate hydronephrosis	11	15
3+ — Severe hydronephrosis	7	10
4 — Nonvisualization	7	3
Total renal units	45*	61**

*Ureter ligated, 1 case.
**Nephrectomy, 1 case.

Actually the wet colostomy without the anal sphincter mechanism acts more like a conduit, there being a constant flow of urine. Figure 3*A* demonstrates a nearly normal pyelogram in the case of M. B., taken seven years and three months after the operation. Progressive hydronephrosis is rare. Usually, with this type of diversion, there is stabilization of the degree of hydronephrosis, and 1 patient, E. M., has survived for seven years and eight months with one kidney, pyelograms of which have remained constant and reveal moderately severe hydronephrosis, with slight cupping.

Fig. 2.—Bag prosthesis for wet colostomy.

Urologic results in the 23 patients treated by anterior pelvic exenteration with the ureters implanted in the bowel above an intact sphincter mechanism show a striking contrast to those treated by wet colostomy (Table 7). Two patients, S. H. and A. A., died in uremia due to progressive renal deterioration. Another, C. D., died of coronary occlusion after more than five years; at the time of death, however, there were marked bilateral hydronephrosis and borderline renal function. Nine patients have had pyelonephritis after leaving the hospital, which has been more persistent and difficult to control than that occurring in patients with wet colostomies; 15 have had hyperchloremic acidosis (only 4 of these were asymptomatic); 3, fortunately, survived periods of coma due to hyperchloremic acidosis, all of which occurred in the first year. There are 2 other patients who died in the first year. In our opinion death was due to coma secondary to hyperchloremic acidosis. These are listed in Table 3.

Nineteen of the patients who underwent anterior pelvic exenteration and bowel transplants take, or have taken, bicarbonate of soda, the average dose being approximately 4 to 5 Gm. per day. One, K. D., finds it necessary to take 12 Gm. per day to maintain a carbon dioxide level above 20 and to remain asymptomatic. Four of those who have survived longest—T. G., Z. A., M. M. and M. P.—have never had

Fig 3.—*A*, case of M B Intravenous pyelogram taken seven years and three months after complete pelvic exenteration with wet colostomy *B*, case of H B, who underwent anterior pelvic exenteration and ureterocolic anastomosis Intravenous pyelogram taken one week after coma secondary to hyperchloremic acidosis

chemical acidosis and have never required sodium bicarbonate. Another, S. W., has always taken sodium bicarbonate; hence, we do not know whether or not hyperchloremic acidosis would have developed At this time we are studying the sodium bicarbonate requirements in this group of patients, varying the dose in accordance with the blood chemical values and the symptoms. If the sodium bicarbonate is administered by spoon the dose cannot be accurately determined, as a teaspoon might even, at times, contain as much as 12 Gm of sodium bicarbonate. A good pyelogram does not necessarily mean that coma and death from hyperchloremic acidosis cannot result. All 3 of the patients who survived coma had pyelograms taken shortly thereafter, which showed nothing worse than mild hydronephrosis (1 plus) on one side and moderate hydronephrosis (2 plus) on the other (Fig. 3*B*). In 3 patients calculi have developed, and in 2 instances this has resulted in a nonfunctioning kidney It was necessary to perform further diver-

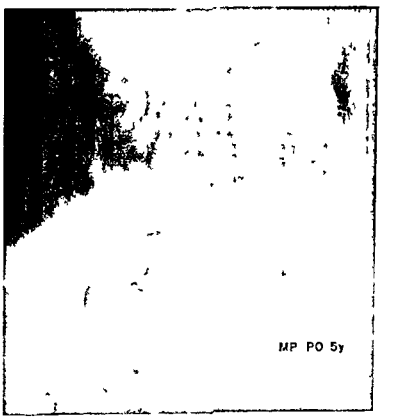

Fig 4.—Case of M P. Intravenous pyelogram was taken five years after anterior pelvic exentera rocolic anastomosis.

TABLE 9.—*Summary of Complete and Anterior Pelvic Exenteration with Ureterocutaneous Anastomosis*

Patient; Age; Diagnosis	*Operation*	*Survival*	*Postoperative Course*	*Hyperchloremic Acidosis*	*Most Recent Blood Chemical Values*		*Pyelograms*	*R*	*L*
1. M.C.; 57; carcinoma of cervix L of N IV	Complete pelvic exeneration; revision of right ureterostomy PO—8 mo.	Living 4 yr. 8 mo.	No pyelitis; wears Singer cups	No	BUN Cl CO_2	9 113 23	Preoperative Postoperative 4 yr. 1 mo.	0 0	3 0
2. N.S.; 57; carcinoma of cervix L of N IV	Complete pelvic exenteration	Living 4 yr. 6 mo.	1 attack of pyelitis; uses catheter	No	BUN Cl CO_2	18.9 110 25	Preoperative Postoperative 4 yr. 5 mo.	4 1	0 1
3. M.E.; 25; radiation necrosis	Complete pelvic exenteration	Living 4 yr. 2 mo.	No pyelitis; uses catheter	No	BUN Cl CO_2	10 98 25	Preoperative Postoperative 2 yr.	4 1	3 1
4. I.K.; 41; recurrent carcinoma of cervix Class SE	Anterior pelvic exenteration	Living 4 yr. 1 mo.	1 attack of pyelitis; wears Singer cups		BUN Cl CO_2	8.9 105 22	Preoperative Postoperative 3 yr. 1 mo.	0 0	4 1
5. M.M.; 51; carcinoma of cervix L of N III	Cystectomy and bilateral ureterocutaneous transplantation 11 days after hysterectomy and node dissection for bilateral ureteral fistulas and narrow margin of excision	Living 3 yr. 3 mo.	No pyelitis		BUN Cl CO_2	11 105 26	Preoperative Postoperative 2 yr. 7 mo.	0 1	0 0
6. F.A.; 40; recurrent carcinoma of cervix Class RE	Complete pelvic exenteration	Living 2 yr. 11 mo.	No pyelitis; uses catheter	No	BUN Cl CO_2	18 100 27	Preoperative Postoperative 2 yr. 6 mo.	2 1	4 1
7. A.F.; 57; carcinoma of cervix L of N IV	Complete pelvic exenteration	Living 2 yr. 11 mo.	No pyelitis; uses catheter		BUN Cl CO_2	24 110 21	Preoperative Postoperative 2 yr. 5 mo.	0 1	4 1
8. M.B.; 66; recurrent carcinoma of cervix Class SEN	Complete pelvic exenteration	Dead 2 yr. 10 mo.	Dead of coronary occlusion; wore Singer cup	No	BUN Cl CO_2	18 105 26	Preoperative Postoperative 2 yr.	4 4	0 0

Fig. 5.—*A*, case of F. A.; preoperative intravenous pyelogram. *B* (same case), intravenous pyelogram taken two and a half years after complete pelvic exenteration and ureterocutaneous anastomosis.

sion of the urine in 3 instances because of progressive renal deterioration. In 1 of the 3 patients, A. D., the ureters were transplanted to the skin; in another, E. B., an ileal bladder was created, and the third, A. M., now has bilateral nephrostomies.

Nevertheless, there are a few excellent results in this group. Eight of the patients have no more than 1 plus hydronephrosis on either side, and these 8 are surely more comfortable than they would be with any type of diversion necessitating an ostomy. Figure 4*A* demonstrates normal pyelograms in the case of M. P. five years after the operation.

Possible improvement in this group of patients can be obtained with more attention directed toward the anastomosis, more knowledge concerning the need of alkali, and further improvements in antibiotic therapy.

Table 8 contains the pyelographic [illegible] on the patients who were treated [illegible] colostomy and anterior exenter[illegible] intestinal transplants. These are presented as separate renal units.

The 8 surviving patients (Table 9) of the 64, who underwent primary cutaneous transplantation have actually done better than any other group if judged by the final urologic result. The incidence of early complications—slough, ureteral retraction, periureteral abscesses, ureteral obstruction, etc.—has been high, resulting in death in 4 instances. Postoperative care is more difficult, and the patient must have almost constant attention. If he survives the first six months, the end result will probably be a good one, especially with the new collecting apparatuses and antibiotics now available. This certainly is a good method of diverting urine in the patient who is in poor condition on the table, or the patient with either unilateral or bilateral hydr[illegible]is whose py[illegible] [illegible]eals n[illegible] [illegible]e or b[illegible] The [illegible]

TABLE 10.—*Pelvic Exenteration with Cutaneous Transplantation of Ureters: Patients Living More than Two Years (Memorial Center)*

	Anterior Exenteration	*Complete Exenteration*	*All Cases*
Total number of cases	2	6	8
Normal or 1+ intravenous pyelogram	2	5	7
Nonvisualization (one side)	0	1	1
Hyperchloremic acidosis	0	0	0
Pyelonephritis	1	1	2
Preoperative nonvisualization	1	5	6
Catheters necessary	0	4	4
Revision of stoma—stricture	0	1	1

TABLE 11.—*Average Blood Chemical Values in Cases of Pelvic Exenteration, Patients Living More than Two Years*

Operation	*Blood Chemical Values*		
	Urea Nitrogen	*Chlorides*	*Carbon Dioxide*
Complete pelvic exenteration with wet colostomy	15.8	111	22.4
Anterior pelvic exenteration with sigmoid transplants	22.6	112	21.3
Cutaneous (both anterior and complete pelvic exenterations)	13.7	106	26.6

definitely increases the early complications, such as ureteral slough. Table 10 summarizes the data on this group of patients. Preoperatively, 6 of the 8 had nonfunctioning kidneys; another had 3 plus hydronephrosis, and the third was operated on because of bilateral ureteral fistulas secondary to a hysterectomy and node dissection. The results in the case of 1 patient, F. A., with poor preoperative function which returned to normal, are shown in Figs. 4*B* and 5.

Table 11 gives the average values determined by the most recent blood chemical tests. At the time these were taken, more than three-fourths of the patients who underwent anterior exenteration with ureterointestinal transplants were taking sodium bicarbonate. None of those with wet colostomies were taking soda; hence the little difference in the values for carbon dioxide and chloride in the two groups.

Anyone doing this type of operation should certainly find a method of diversion that he can handle and persist with it until his results are known. Shifting from one type of diversion to another will do nothing but add to the existing confusion. Every case should be adequately documented with regard to preoperative and postoperative pyelograms, blood chemical values, history of pyelonephritis, symptoms of acidosis and amount of alkali needed. Only by comparing long-term results in different groups of cases can proper conclusions be reached.

SUMMARY

1. The wet colostomy has proved to be a satisfactory method of urinary diversion in 31 cases in which the patients are living two to eight years after complete pelvic exenteration.

2. The urologic results following ureterointestinal transplantation above an intact anal sphincter in anterior pelvic exenteration do not compare favorably with those of the wet colostomy. There is a higher mortality rate, and the incidence of renal deterioration, pyelonephritis and acidosis is greater. At present, other methods of diversion, notably the ileal bladder and the isolated rectal pouch, are being investigated.

3. Although management is difficult and the incidence of complications is high in the immediate postoperative period, the long-term pyelographic results in this small series of 8 cutaneous ureterostomies have been very satisfactory.

ZUSAMMENFASSUNG

1 Die feuchte Kolostomie hat sich als ein zufriedenstellendes Verfahren der Harnableitung bei 31 Patientinnen erwiesen, die nach totaler Ausraumung des kleinen Beckens zwei bis acht Jahre uberlebten

2 Die urologischen Ergebnisse nach Einpflanzung der Harnleiter in den Darm oberhalb des erhaltenen Schliessmuskels des Afters bei Ausraumung des vorderen kleinen Beckens sind im Vergleich mit denen der feuchten Kolostomie nicht gunstig Die Sterblichkeitsquote ist hoher, und das Auftreten von Nierenschadigung, Pyelonephritis und Azidose ist haufiger Es werden augenblicklich noch andere Verfahren der Harnableitung ausprobiert besonders die Herstellung einer Blase aus dem Ileum und die isolierte Mastdarmtasche

3 Die kutane Ureterostomie hat in einer kleinen Serie von acht Fallen zu sehr befriedigenden langdauernden pyelographische nachgewiesenen Erfolgen gefuhrt, obgleich es sich um ein schwieriges Behandlungsverfahren handelt und Komplikationen in der Zeit unmittelbar nach der Operation haufig auftreten

RÉSUMÉ

1 La 'wet colostomy" s'est revelee etre une methode satisfaisante de deviation urinaire dans 31 cas, tous vivants, depuis deux a 8 ans apres exenteration pelvienne totale

2 Les resultats urologiques de la transplantation uretero intestinale au dessus du sphincter anal intact dans l'exenteration pelvienne anterieure ne se comparent pas favorablement a ceux de la "wet colostomy" Le taux de mortalite est plus eleve et la frequence de lesions renales, de pyelonephrite et d'acidose est plus grande Actuellement d'autres methodes de deviation, notamment la vessie iliale et le cul-de-sac rectal isole font l'objet de recherches

3 Bien que le traitement soit difficile et les complications nombreuses durant la premiere periode post operatoire, les resultats eloignes de la pyelographie dans cette petite serie de 8 ureterostomies cutanees ont ete tres satisfaisants

RESUMEN

1 La colostomia humeda ha probado ser un metodo satisfactorio de diversion urinaria en 31 casos en los cuales los pacientes estan viviendo dos a ocho años despues de exenteracion pelvica completa

2 Los resultados urologicos siguiendo a la transplantacion ureterointestinal, arriba del esfinter anal intacto en la exenteracion pelvica anterior no se compara con esos de la colostomia humeda Hoy un alto porcentaje de mortalidad, y la incidencia de deterioró renal pielonefritis y acidosis es mas grande Al presente, otros metodos de diversion, notablemente el vesicoileal y el aislado saco rectal estan siendo investigados

3 Aunque el manejo es dificil y la incidencia de complicaciones es alta en el periodo postoperatorio inmediato el largo tiempo de resultados pielograficos en esta pequeña serie de ureterostomias cutaneas han sido muy satisfactorios

SUMARIO

1 A colostomia provou ser um metodo satisfatorio de derivação urinaria em 31 casos de pacientes que estão vivendo dois a oito anos depois da exenteração pelvica

2 Os resultados urologicos que se seguem ao transplante uretero intestinal acima do esfincter anal intacto na exenteração pelvica anterior não podem ser idênticamente comparaveis aos obtidos com a pro[illegible]ia [illegible] uma taxa [illegible]

incidência de esclerose renal, pielonefrite e acidose é maior. Presentemente outros métodos de derivação urinária, principalmente a bexiga ileal e a ampola retal isolada, estão sendo estudados.

3. Considerando, todavia, que o tratamento é difícil e que a incidência de complicações no pós-operatório imediato é elevada, os resultados apreciados na pielografia a longo prazo e feitos numa pequena serie de oito casos de ureterostomias cutâneas se mostraram muito satisfatórios.

RIASSUNTO

1. La colostomia di drenaggio si è dimostrata il metodo più soddisfacente di derivazione urinaria; 31 malati sono viventi da 2 a 8 anni dopo l'exenteratio pelvica completa.

2. I risultati che si ottengono col trapianto uretero-intestinale, a sfintere anale integro (nell'eviscerazione pelvica anteriore) non sono paragonabili a quelli ottenuti con la colostomia. Vi è una più alta mortalità operatoria e una maggior frequenza di complicazioni renali, pielonefriti e acidosi. Sono in corso ricerche su altri metodi di deviazione urinaria: la vescica ileale e la tasca rettale isolata.

3. Benchè il trattamento sia difficile e la frequenza di complicazioni post-operatorie elevata, la ureterostomia cutanea si dimostra molto soddisfacente e ciò è provato da controlli pielografici eseguiti a distanza di tempo in una serie di pazienti così operati.

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Men of genius supply the substance of history, while the mass of men are but the critical filter, the limiting, slackening, passive force needed for the modification of the ideas supplied by genius. Stupidity is dynamically the necessary balance of intellect. To make an atmosphere which human life can breathe, oxygen must be combined with a great deal—with three-fourths—of azote. And so, to make history, there must be a great deal of resistance to conquer and of weight to drag.

—*Amiel*

Present-Day Treatment for Carcinoma of the Bladder

GERSHOM J. THOMPSON, M.D., F.A.C.S., F.I.C.S.

ROCHESTER, MINNESOTA

IN choosing a method of treating a patient who has a vesical neoplasm, the urologist naturally is influenced by the results he has obtained in the management of patients with similar conditions. He is inevitably cognizant of the benefit, or the lack of it, that has resulted from his earlier therapeutic efforts. He adjusts his practices so that the most comfort possible, the greatest relief of symptoms and the best adjustment to all circumstances, economic and otherwise, can be obtained for the patient. In formulating and in applying methods of treatment he is influenced to some extent by long-range results; so-called cure, as exemplified by five-year survival rates, also sways his opinion. These are by no means the only considerations, however, in the selection of a method of treatment. Several factors must be weighed as each case presents itself before any particular course of therapy is selected. Arbitrary employment of only one method and exclusion from consideration of all others is indeed a poor policy.

Among the important factors to be considered are the age of the patient; the duration of symptoms; the size of the tumor; its grade as assayed by microscopic examination of adequate portions of it; its general contour, especially with regard to whether it is pedunculated or broad based; whether it is superficial or infiltrating; how much of the vesical wall is involved and, of greater significance than any of these, how much useful bladder will remain when the tumor is removed or destroyed.

Another, perhaps somewhat intangible, consideration is an estimate of the biologic potential of the growth. In these days the urologist sees an increasing number of patients who either have put off treatment or have been receiving treatment but continue to have trouble with recurrent growths.

For instance, not infrequently I have seen a patient who has known for several years of the existence of tumors in his bladder, but his general health has remained good; obstruction of the upper part of the urinary tract has not developed, and the problem is that of keeping these recurrent tumors under control. In such a case the biologic potential of the growth is low. In direct contrast, I have seen other patients in whom within a few weeks, judging by the symptoms, a growth has formed and rapidly increased in size; one of the ureters has become obstructed, and in spite of early operation, even of the radical type, extension through the vesical wall has taken place and the dissemination of highly malignant cancer has occurred which precludes cure by any method of treatment now available.

In a case of this kind the growth has a high biologic potential that defeats the efforts of even the most diligent physician and will cause [illegible] The patient who suffers with [illegible] kind is

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From the Section of Urology, Mayo Clinic and Mayo Foundation, Rochester The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

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indeed unfortunate, because no operation, even total cystectomy and adequate diversion of the urine, will be curative. The enigma, of course, is how the biologic potential can be predicted in any case. There is no laboratory test, no infallible difference microscopically detectable and no exact method based on clinical experience that enables one to select in advance these highly lethal tumors and to temper judgment as to which methods of treatment should be used and which should be avoided.

Fortunately the rapidly growing, highly malignant tumor is in the minority. The great majority of epithelial new growths in the bladder are relatively benign; therefore, comparatively conservative methods of treatment will control them. Furthermore, it is becoming increasingly apparent, provided an early diagnosis is made, that many tumors of a high grade of malignancy can be successfully excised by conservative methods and a cure can thus be effected. The crux of the matter is early diagnosis.

Early Diagnosis.—It is unfortunate that textbooks written several decades ago emphasized that painless hematuria is the rule in cases of vesical tumor. As a result, if urination was painful and if pyuria and bacteriuria were present, many physicians assumed that infection was the sole cause of the symptoms. Many patients, therefore, were treated for infection without even the benefit of cystoscopic study. Others were subjected to examination in the office with local anesthesia, which is often unsatisfactory, and unless some easily detectable gross lesion was visualized the examining physician was content to treat the patient with urinary antiseptics. Often weeks went by under this regimen and, even though the patient continued to complain, adequate examination of the bladder under good anesthesia was deferred for many months while the tumor continued to grow and finally attained an incurable status. Through the years I have encountered many such cases in which I believe a cure might have been possible if cystoscopic examination and adequate biopsy had been performed on lesions that were assumed to be inflammatory. Cancer of the bladder, even in its incipient form, usually causes dysuria, pain, vesical spasms and increased frequency of urination. To neglect to perform another cystoscopic study at an early date on all patients failing to receive benefit from conservative ministrations is indeed a grievous error, for if a tumor is thus long neglected, tragedy for the patient is the result. Particular emphasis is placed on the term "adequate biopsy." By this I mean the removal of large portions of tissue with the resectoscope, and this procedure necessitates complete anesthesia. Biopsy done in the office, involving removal of tiny bits of tissue, is a useless procedure in almost all instances.

The excretory urogram is a valuable tool in early diagnosis. The condition of the upper portion of the urinary tract can be assayed and the contour of the vesical wall can be studied; flattening of the wall or other distortion of it and often filling defects provide supplemental evidence with which to urge cystoscopic study. Urographic study should, of course, precede cystoscopic investigation.

Choice of Procedure.—The method to be chosen for the removal of a particular tumor or the control of the peculiar tendency toward formation of recurrent tumors exhibited by many patients has provided unlimited discussion and expressions of opinion among urologists for many decades. There is not the slightest doubt that it will continue interminably, especially since even those with great clinical experience inevitably revise their own opinions as time goes on.

Somewhat nebulous basic tenets used by

my associates at the Mayo Clinic and myself in coming to a decision on procedure are as follows:

1. The results of treatment for large infiltrating high-grade tumor are notoriously bad; many patients having this type of lesion are actually incurable when first seen.

2. When a tumor extends into the perivesical tissues its cure is extremely unlikely, no matter how extensive a surgical procedure is performed. Operation that includes lymphadenectomy does not usually cure such patients.

3. Removal of the urinary bladder should be considered a major physical catastrophe. All necessary substitutes for the bladder automatically involve future hazards. Up to the time of writing no type of diversion of urine has been devised that is entirely foolproof.

4. Experience suggests that most patients apparently cured by cystectomy could have had the particular lesion completely removed by a more conservative procedure.

5. The limits of the malignant lesion are sometimes difficult to determine, even with the entire bladder exposed and with highly dependable frozen-tissue methods of diagnosis immediately available. This has been demonstrated on several occasions by the early recurrence of a growth after extensive segmental resection or hemicystectomy.

6. Complete extirpation of the bladder for tumors of low biologic potentiality is unwarranted and unnecessary. These tumors can be kept under control for many years by periodic examinations and repeated treatment.

Examination and thoughtful analysis of these tenets might give the impression that certain prejudices exist and that there is considerable uncertainty with regard to the role of cystectomy. The question might be asked, What are the basic criteria for the use of cystectomy? Definition and description of certain groups of cases for which this operation can be advised are extremely difficult, if not impossible. It has always been my opinion that only through individual analysis of many factors in each case can one properly advise cystectomy. I have performed conservative operations in literally dozens of cases in which cystectomy had previously been urged by others; I have re-examined these patients for years and treated some of them for recurrences. Those who have died of cancer are far fewer than those who have continued in good health with a useful bladder.

The presence of certain conditions, however, seems indicative to the urologist that cystectomy should be performed. These conditions, briefly described, are as follows:

1. Uncontrollable papillomatosis which, in spite of extensive destruction or removal of rapidly recurring lesions at intervals of two to three months, continues to re-form and there seems no possibility of keeping ahead of the lesions. These are usually Grade 2 transitional cell growths.

2. Small or moderate-sized infiltrating primary lesions the limits of which are so poorly defined as to defy accurate transurethral excision. Palpable extension beyond the bladder as determined on bimanual examination should be absent.

3. The small contracted bladder that has resulted from repeated therapeutic efforts over a number of years and contains at least one remaining tumor or site of recurrent neoplastic growth.

4. Infiltrating recurrent lesions that develop after conservative procedures, such as segmental resection, if the chance of cure is reasonably good.

5. Multiple high-grade tumors that would [illegible] te remo[illegible] by multiple segm[illegible]s and [illegible] leave en[illegible]

6. In the female, involvement of the vesical neck to such an extent that segmental resection would almost certainly result in incontinence.

It is only natural that every experienced urologist might choose to add several other conditions to those just mentioned. It should be noted particularly that large, extensive, high-grade tumors are not included among the conditions suitable for cystectomy. My opinion is that such tumors should be cared for by one of two methods: either by transurethral excision of all the tumor that projects into the vesical cavity, followed by cobalt irradiation, or by diversion of urine and extensive roentgen therapy of the tumor, with no attempt to remove the bladder.

If cystectomy is performed when a high-grade tumor has extended through the vesical wall, one tears through active malignant growth, and this is likely to lead to the early death of the patient from widespread dissemination of neoplastic cells. I have seen a number of patients in whom this undoubtedly occurred.

It is a much better policy, if one is chiefly interested in statistical data, to lean toward removal of smaller tumors by cystectomy than to have the opposite attitude. One should be cognizant, however, that many of the smaller growths can be cured by conservative procedures.

Choice of Method for Diversion of Urine.—There are several widely accepted methods of diverting the urinary stream, none of them perfect. At present the only one that provides perfect continence, granted that the sigmoid portion of the colon is normal and the anal sphincter intact, is ureterosigmoidal anastomosis. Through the years this operation has enabled many patients to live a life reasonably near normal, unfettered by tubes, urinal bags or other devices that can make life miserable. There are the hazards of infection and of electrolyte imbalance due to reabsorption of urine. Whether to risk these hazards, to advise one of the newer avenues of diversion instead or to depend on nephrostomy for drainage is something the physician must decide, because he knows most about the problem.

There is a certain finality about some methods as contrasted with others. For instance, one can shift with greater technical ease from ureterosigmoidal implantation to other types of diversion than from cutaneous ureterostomy to intestinal diversion. The particular method employed depends, to some extent, on the condition of the ureters when the operation is performed. As a rule the best results of sigmoidal implantation are obtained when the ureters are of normal size or are only minimally dilated. The particular method of anastomosis employed by most surgeons has changed through the years; at present the majority seem to agree that a combination of mucosal anastomosis and a tunnel through the musculature of the bowel provides the best result. Unanimity of opinion, however, does not exist.

In the experience at the Mayo Clinic, so-called artificial bladders, such as the cecal pouch and the ileal loop, do not provide a perfect solution to the problem. The cecal bladder must be emptied with a catheter and usually leaks, in spite of the hope that the ileocecal valve will be competent. An ileal pouch is not actually a pouch but a conduit. There is certainly much less risk of electrolyte imbalance with the two methods last mentioned. The thesis has been advanced that it is sometimes possible to sterilize these intestinal segments, but in practice one comes nearer and nearer to certainty that any opening in the body connected to the skin cannot remain uninfected permanently.

It has been proposed that, if a proximally closed sigmoidal pouch is used and the fecal stream is diverted either to the

abdominal wall or to the perineum under the anal sphincter, the sigmoidal reservoir can almost certainly be sterilized. Actually, even these methods fall short of the ambitions of their proponents.

Some of the most contented and continuously healthy patients I have seen are those in whose cases nephrostomy or cutaneous ureterostomy has been established after other methods of diversion have failed. It is certainly important for the surgeon to revise his opinion and shift to another avenue of drainage when the one originally employed has failed. This should be done before extreme renal deterioration develops.

Transurethral Operations. — The early methods of Beer[1] are seldom employed today in the primary treatment of even very small vesical tumors. Electrocoagulation or fulguration of tiny papillomas or of small recurrent lesions without biopsy can be condoned. If a conservative operation is chosen, all other types of vesical neoplasms should be excised with a resectoscope. This procedure will provide the pathologist with good-sized portions of the growth—in fact, with all of it, as well as some of the underlying vesical wall. Thus, by appropriate study, he can determine the type of growth and its grade, that is, whether it is comparatively benign or highly malignant; he can also learn whether its cells have infiltrated into the submucosa and into the muscle. Pedunculated tumors, including all of the pedicle, can be removed quickly. The portion of the vesical wall to which the pedicle was attached also can be excavated. This is much better than electrocoagulation, which leaves a stump or nubbin of desiccated tissue that must slough away.

For the broad-based superficial lesion involving only the mucosa or for the growth that infiltrates the submucosa, resectoscopic removal leaves a healthy uninvolved surface on which the mucosa will rapidly regrow. No sloughing of tissue results if the excision is done properly.

Infiltrating lesions, regardless of the grade of the tumor, can be excised deeply; the surgeon may go well into the musculature of the bladder, down to the serosa if necessary. Kaplan and I[2] have described these methods of resection in detail and have pointed out certain advantages of the transurethral operation for high-grade neoplasms. We reported the use of this procedure combined with irradiation for patients on whom any other type of operation, including cystectomy, was deemed inadvisable.

It should be emphasized that these operations accomplish excision of the lesion. The growth is cut away completely; specimens of vesical wall underlying or in the periphery of the involved region are removed subsequently and studied by frozen-tissue methods in order to make it as nearly certain as possible that malignant tissue does not remain. In some cases it has been impossible to resect deep enough, without undue hazard to the patient, to eliminate all traces of neoplasm. The patients in these cases were treated subsequently either by implantation of radium or by high voltage irradiation. For some of the growths transurethral partial cystectomy was performed.

More recent experience has justified the conclusion that transurethral partial cystectomy can be accomplished, especially for the smaller deeply infiltrating lesions, without prohibitive risk. Minimal extravasation of the irrigating fluid does not cause complications. If one finds, in the course of operation on a large tumor, that persistence may result in considerable extravasation, one has the choice of discontinuing the procedure and treating the patient with irradiation or turning immediately to suprapubic segmental r section.

Suprapubic Opera i ıre
be c [illegible] as a

those cases in which, technically, a transurethral operation would be extremely difficult. The location of the growth may be a deciding factor, or the size of the tumor may preclude more conservative methods.

In some cases one might elect to do transvesical excision without actually performing segmental resection of a portion of the adjacent vesical wall. In the majority of instances, however, in which one decides to open the bladder, partial cystectomy will be the operation of choice if a conservative operation rather than total cystectomy is deemed best. Reimplantation of the ureters to another portion of the bladder is sometimes necessary when the growth involves the intramural portion of the ureter so extensively that wide resection of it is required. Good results after such reimplantation are the rule rather than the exception. In all cases in which segmental resection is performed it is important to subject portions of the remaining edges of the excised growth to frozen-tissue examination in order to be certain that remnants of infiltrating tumor have not been left behind.

Irradiation Therapy.—A few patients will be encountered who have vesical neoplasms so extensive that it seems unwise to attempt any type of surgical removal, and the condition of some patients may be so poor that it seems best to attempt only palliation. Sooner or later almost every urologist has the experience of obtaining an unusually excellent response to irradiation alone in an occasional case of this kind. This is, of course, the rare exception.

In most cases in which irradiation is used it is combined with surgical treatment in the hope of eradicating or controlling all growth at the base of the lesion when the lesion has been largely or completely excised, but the possibility remains that a microscopic portion of the tumor may have been missed. It is my opinion that in such cases it is important not to use excessive amounts of irradiation. It is sometimes difficult to get the roentgen therapist to agree on this point.

A new method of radiation implantation has been described by Vermooten,[3] who employs a nylon suture to place radioactive cobalt. This certainly provides for excellent spacing of the radiation within the base of the tumor.

Another method of employing irradiated phosphorous solutions by direct injection into the vesical wall has been described.[1] Its evaluation must await the passage of time.

Irradiation by means of the cobalt bomb seems extremely effective in the few cases in which it has been employed. It is apparently a most encouraging type of therapy. Sufficient time has not elapsed to permit accurate evaluation of the method.

CONCLUSIONS

In the majority of cases of vesical neoplasm, transurethral excision of the tumor is the most effective method of treatment. Total cystectomy and diversion of urine of an appropriate type are useful in a small proportion of cases. When total cystectomy seems undesirable, segmental resection can be employed in those cases in which transurethral operation is technically difficult or impossible.

A combination of transurethral excision and irradiation is the method of choice of the majority of urologists today. Irradiation by means of the cobalt bomb seems most promising.

CONCLUSIONES

En la mayoría de casos de neoplasma vesical, la excisión transuretral del tumor es el método más efectivo de tratamiento. La cistectomía total y la diversión urinaria de un tipo apropiado son útiles en pequeña proporción de casos. Cuando la cistecto-

mia total parece indeseable la reseccion segmental puede emplearse en aquellos casos en los cuales la operacion transuretral es tecnicamente dificil o imposible

Una combinacion de excision transuretral y terapia de irradiacion es el metodo de eleccion de la mayoria de urologos hoy dia La terapia de irradiación por medio de la bomba de cobalto parece muy prometedora

RIASSUNTO

Nella maggior parte dei casi di tumore della vescica il trattamento piu efficace e rappresentato dalla escissione del tumore per via transuretrale Solo in una piccola percentuale di casi e utile praticare la cistectomia totale e la derivazione dell'urina Qualora la cistectomia totale non sia opportuna e quando la operazione transuretrale e impossibile o tecnicamente difficoltosa, si puo fare una resezione segmentaria

La maggior parte degli urologi preferisce, oggi, combinare la escissione transuretrale con la terapia radiante, e la irradiazione viene fatta con la bomba al cobalto che e quella che da i migliori risultati

CONCLUSIONS

Dans la majorite des cas de neoplasme de la vessie l'excision transurethrale de la tumeur est le meilleur traitement La cystectomie totale et la derivation urinaire ne sont utiles que dans un petit nombre de cas Lorsque la cystectomie totale semble indesirable on peut effectuer une resection partielle la ou la resection transurethrale paraît techniquement difficile ou impossible

Une combinaison dexcision transurethrale et d'irradiation est aujourd'hui la methode de choix L'irradiation par la bombe de cobalt semble pleine de promesses

SCHLUSSFOLGERUNGEN

Fur die Mehrzahl der Falle von Harnblasengeschwulsten bildet die transurethrale Resektion der Geschwulst die wirksamste Behandlungsmethode In einer kleinen Zahl von Fallen ist die totale Blasenresektion mit einer geeigneten Form der Ableitung des Harnflusses nutzlich Wenn die totale Blasenresektion unerwunscht erscheint, lasst sich in Fallen, bei denen eine transurethrale Operation technisch schwierig oder unmoglich ist, die Resektion eines Blasensegments ausfuhren

Die heute von der Mehrzahl der Urologen bevorzugte Behandlungsmethode besteht in einer Kombination von transurethraler Resektion und Bestrahlung Die Ausfuhrung der Bestrahlung mit der Kobaltbombe scheint vielversprechend zu sein

CONCLUSOES

A excisão transuretral e o metodo melhor de tratamento da maioria dos casos de neoplasmas vesicais A derivação urinaria e a cistectomia total bem orientadas são uteis em pequena proporção de casos Quando a cistectomia total não e desejavel pode ser realizada a operação transuretral e, quando esta for tecnicamente dificil ou impossivel aconselha a ressecção segmentar

A maioria dos urologista atualmente prefere uma combinação de excisão transuretral e irradiação A irradiaçao pela bomba de cobalto parece promissora

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The growing interest in history of medicine shows that medical men feel the need of the historical attitude of mind. We have, however, to distinguish the real history of medicine from the philology of medicine, which consists of the study of the lives and works of the physicians of the past. This is a necessary discipline, but it is the investigation of medical problems in the light of those who have thought about them in the past that constitutes the real historical attitude of mind. It is not a matter of special chairs or examinations but an attitude that should permeate clinical teaching, as it has permeated the teaching of a William Osler, of a Clifford Allbutt, and of many Continental teachers at whose feet I have sat years ago.

History gives to the physician the general unified view of medicine and thus counterbalances the negative effects of specialization and ultra-technology that threaten to disrupt our great science. It thus plays a great role in the integration of medicine, which is dominating contemporary medical thinking. A most important aspect of his integration consists in the link between the natural scientific basis of medicine —physiology, pathology, nosology—and its cultural scientific basis—psychology, sociology, history and philosophy. Medicine is not only a natural science but also a cultural science, because we have to deal with man, and man is not only body but also mind and spirit. History shows us medicine in its humanistic and social aspect as well as in its scientific aspect and thus helps us towards an effective practice.

In all the recent discussions on medical education the importance of the history of medicine in the building up of the physician has been sadly neglected. History is, however, a vital factor, as much for the understanding of scientific principles as for developing the ability of independent thinking, of spiritual steadfastness, of constructive criticism and moral courage. The old saying *Historia vitae magister* applies to medicine as well as to life in general. I am not advocating new chairs, or matter for examinations, but an attitude of mind.

History of medicine allows us to understand thoroughly our contemporary medical problems. In the original Greek, history means "investigation" and not the recording of things past, which is only an aid to investigation. History of medicine is therefore investigation of our medical problems in the light of what has been thought about them in the past, and this allows for the perfect understanding of these problems. In science, to repeat the words of Benedetto Croce, the highest form of knowledge is historical knowledge.

—*Cawadias*, Brit. M. J., Oct. 13, 1956

The Scalenus Anticus Syndrome

AVERILL STOWELL, M.D., F.A.C.S., F.I.C.S.

TULSA, OKLAHOMA

DURING the past twenty years there has been a great deal of controversy about the role of the scalenus anticus muscle in the production of pain in the neck, shoulder and arm. The lack of agreement among experts has arisen because of poorly defined diagnostic tests, the psychosomatic features of the syndrome and, in treatment, failure to resect the muscle adequately.

An understanding of the mechanical factors responsible for the typical scalene pain produced by muscle pressure on the cervical nerve roots is important in diagnosing this condition, and the location of the pain, as well as the direction of its radiation, must be known (Fig. 1).

In reviewing 230 cases observed since 1948, it became evident that two chief divisions of the syndrome should be defined. With the first, the symptoms come on for no apparent reason in the prime of life; with the second, they follow trauma to the neck, chest or shoulder. For the sake of clarity I shall call these the *primary* scalenus syndrome and the *secondary* (post-traumatic) scalenus syndrome. The secondary type, especially common after whiplash injuries of the neck, has been often overlooked or labeled, erroneously, "cervical disc pathology."

As with all medical diseases, a history is important. It is particularly so in dealing with this syndrome; an adequate account of the time and manner of onset of the pain or numbness is essential. A typical history is as follows: A young woman entered the office and complained of a peculiar dull aching pain in the left shoulder, which started after she had been typing for several hours. Somewhat later in the day she stated that the ring and little fingers "went to sleep" and that if she continued working the whole arm became painful, weak and numb. The hand would

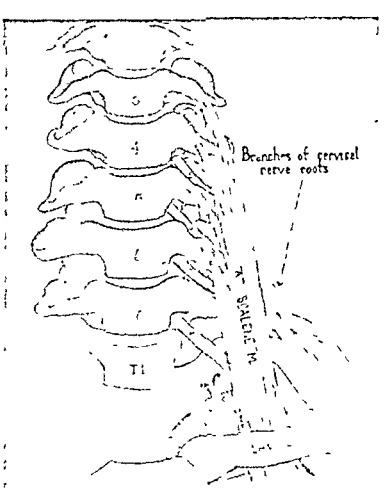

Fig. 1.—Normal anatomic relations of anterior scalene muscle.

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change color, becoming bluish, and she would shake it to "restore the circulation." On some days she had a left occipital headache of moderate severity, which never radiated in an anterior direction. Further questioning revealed that in the early morning her left arm and hand often ached and were numb.

Several features of this history should be correlated with the complaints of other patients. The pain described by a patient with a scalenus anticus syndrome is usually dull, aching and diffuse, but may be localized along the medial surface of the elbow and hand and in the occipital area or below the scapula. The numbness is most often noted when the patient is lying down or when the arm is outstretched as in typing, maneuvers that narrow the thoracic outlet, exit of the nerve roots. It is usually referred to the ring and little finger areas. It is intermittently present, and the subjective symptoms are always greater than the objective signs. The weakness or loss of grip is minimal, and atrophy of the intrinsic musculature of the hand has not been noted in our series. Atrophy, however, of the biceps, deltoid and supraspinatus muscles has been noted in a small percentage of cases, owing to the relatively rare occurrence of constriction of the fifth cervical nerve root by an aberrant artery (Fig. 2).

Examination.—On examination the diminution or absence of the triceps reflex on the affected side is the most common neurologic sign, and hypesthesia of the ulnar area of the hand is relatively common. Movement of the neck is rarely limited, and the neck compression tests described by Spurling in cases of cervical disc give equivocal or negative results. The most important single sign is the ability of the examiner to reproduce the pain by pressure in the supraclavicular or scalene triangle (Fig. 3). The pulse obliteration tests described by Adson and all other tests for the presence of a scalenus syn-

Fig. 2.—Variant of scalenus syndrome, with an aberrant artery producing clinical picture on fifth cervical root. *Left*, preoperative photograph of patient: *right*, postoperative photograph.

drome have been unreliable in my hands, and I should like to emphasize again that reproduction of the pain, together with its radiation and numbness, by gentle pressure over the lateral margin of the sternocleidomastoid muscle just above the clavicle is essential in making the diagnosis. If the results of this test are consistently negative, grave doubt should be raised as to the diagnosis of scalenus syndrome.

Evaluation after two or more examinations is often necessary. Frequently, in this department, after the first visit of a patient with these complaints, the impression was that a large psychosomatic factor existed, and in more than 20 per cent of the present series a diagnosis of neurosis was recorded after the first examination. Negative results from testing are important in making the diagnosis. Specifically, the Spurling (head rotation-compression) test for cervical disc should not produce pain. Roentgenograms of the cervical portion of the spine may show straightening of the normal cervical curve, but no evidence of severe osteoarthritis or pathologic change in the discs should be present. The pain and numbness should be intermittent or should vary in intensity. Periarthritis of the shoulder, bone tumors, aneurysms and ulnar neuropathic conditions due to pathologic change in the elbow must be ruled out. In 12 cases of this series the diagnosis of cervical disc was seriously considered and myelographic studies were performed.

Treatment. — After the first or second visit of the patient a working diagnosis of a scalenus syndrome was established. Medication, consisting of intramuscular B-12, a tranquilizing drug or sedative, Flexin® or Kused,® was prescribed, and the patient was asked to return. Heat and shoulder girdle exercises were advised. The patient returned in one, two and four weeks for evaluation. At the end of one month, if there was no definite increase

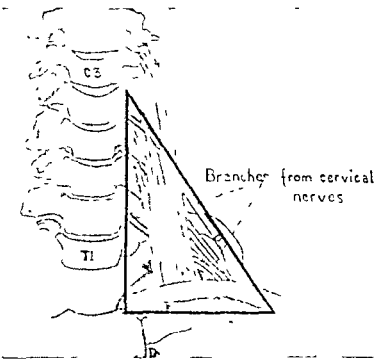

Fig. 3.—The supraclavicular triangle. Hyperabduction of shoulder or forward extension of arm narrows supraclavicular triangle and increases tension of scalenus anticus muscle. Lying down also narrows triangle, through which cervical nerve roots pass. These mechanical factors produce "tingling" when pressure is exerted on nerve roots.

in the severity of the symptoms and the patient still had pain, he was admitted to the hospital for cervical traction and ultrasonic heat therapy. It should be noted that stretching the neck may aggravate the syndrome and precipitate the need of early surgical intervention. Injections of procaine into the scalenus muscle, utilized in 36 cases, have not been particularly satisfactory from either the diagnostic or the therapeutic standpoint. There was no correlation between a successful block and the results obtained by surgical intervention with resection of the scalenus muscle. If the medical regime was unsuccessful, the patient was advised to undergo muscle resection.

The operation I utilize is different from those previously described. This department is convinced that section of the muscle alone is inadequate, and that at least 4 cm. of the belly of the muscle should be removed and careful dissection and division of the fibrous bands

originating from the transverse processes of the sixth and seventh cervical vertebrae be performed. The fifth, sixth, seventh and eighth cervical nerve roots should be visualized and the omohyoid muscle resected. Figure 4 demonstrates the technic. An incision is made 3 cm. above the clavicle, with the external jugular vein as the lateral boundary. The sternocleidomastoid muscle is identified, as are the sensory nerves originating from the fourth cervical level and proceeding to the anterior thoracic wall. These are retracted medially, and occasionally a portion of the lateral head of the sternocleidomastoid muscle is divided to permit more adequate exposure. The phrenic nerve is identified and mobilized for medial retraction. The muscle is then stripped of fat, carefully isolated from overlying arteries and veins and separated medially from the vertebral artery and vein and distally from the subclavian artery. Clamps are then placed on the lateral third of the muscle, 4 cm. apart. After thorough exposure of the nerve plexus has been obtained, the fibrous bands observed medially are carefully divided. These normally extend into the posterior belly of the muscle. Complete hemostasis is obtained, and the incision is closed. Ambulation is started at the end of twelve hours and exercises at the end of seventy-two hours.

Results.—The results in this series have been satisfactory. Medical regimes, reassurance and careful follow-up have produced complete cures in 62 of 76 patients, and in only 6 patients have the symptoms continued unabated (Table 1). Surgical resection of the muscle has resulted in

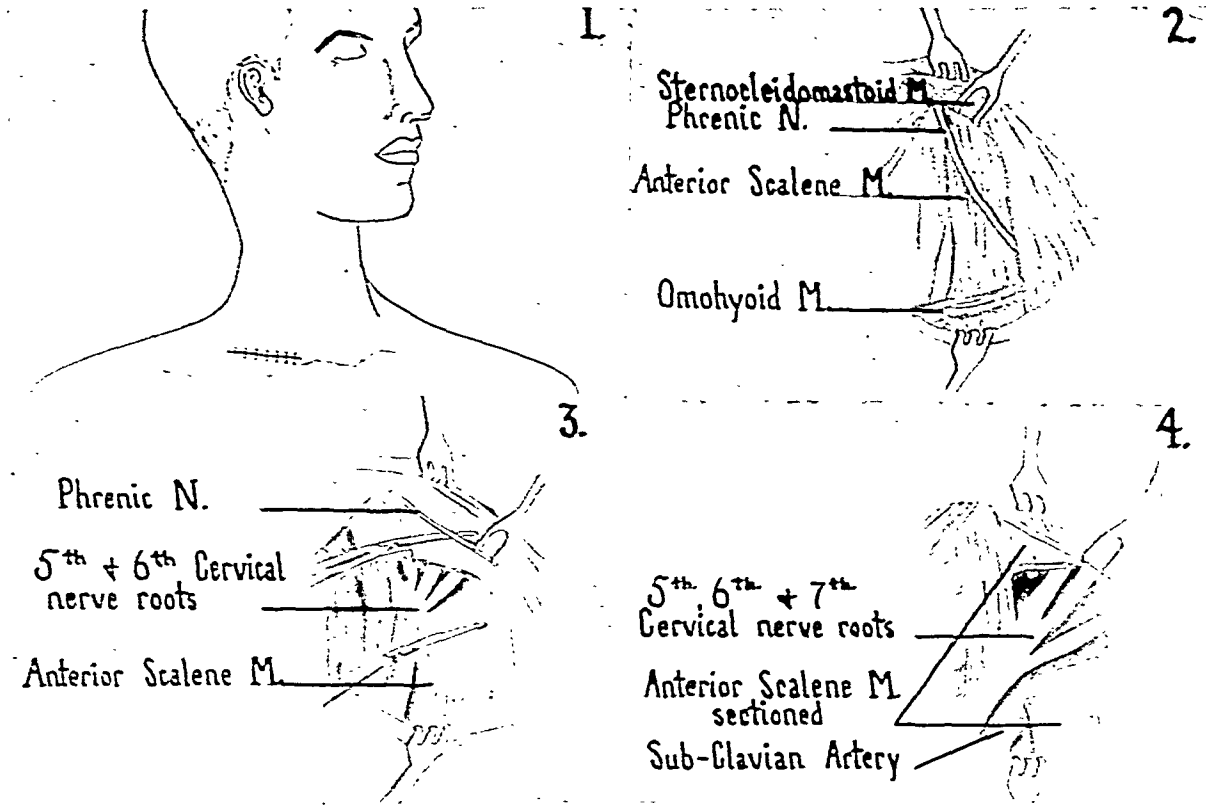

Fig. 4.—Operative technic: *1*, incision; *2*, exposure of anterior scalene muscle and phrenic nerve; *3*, exposure of fifth and sixth cervical nerve roots (anterior scalene muscle has been partially cut); *4*, anterior scalene muscle sectioned, exposing fifth, sixth and seventh cervical nerve roots and subclavian artery.

98 complete cures, 32 almost complete cures, 13 fair results and 11 unsatisfactory results. The patients in Group 3 (almost complete cures) still have some occasional pains or numbness but have had no restriction of their normal activity. Those in Group 2 have had to limit their activities and still have pain; less, however, than prior to the operation. The failures in Group 2 and Group 1 all occurred in cases of severe whiplash injury or of hypochondriasis. In 9 cases the condition failed to respond to any form of treatment, and in 2 of these no adequate reason could be found for the failure (Table 2). In general, this has been the most thoroughly satisfied group of patients I have ever had.

It behooves the surgeon to ponder a little about this syndrome. Many of my patients have been treated previously for bursitis, Pancoast tumor, disease of the shoulder, cervical disc, psychoneurosis, arthritis or angina. During recent years, more and more patients are referred to this department with the diagnosis of scalenus anticus syndrome. Yet, in my opinion, the syndrome is no more common now than it was twenty years ago, except perhaps after whiplash injuries. Probably, in the past, the diagnosis in many cases has been missed.

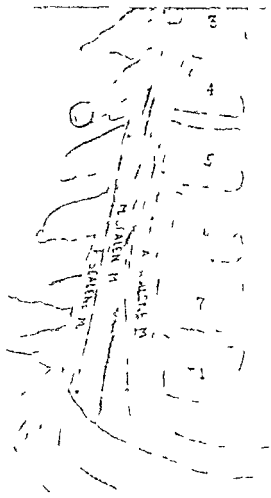

Fig. 5.—Straightening of cervical curve and increased tension of scaleni after whiplash injury of neck.

TABLE 1.—*Results of Treatment of the Scalenus Anticus Syndrome*

	0	1	2	3	Cured	Total
Medical treatment	3	3		8	62	76
Surgical treatment	9	2	13	32	98	154
Total						230

TABLE 2.—*Surgical Failures*

Tumor of spinal cord	1
Multiple operations (adhesions)	3
Cause unknown	2
Cervical disc	2
Severe whiplash injury	3
Total	11

The factors involved in the production of the pain, numbness and weakness of the scalene syndrome are essentially mechanical. Increased scalenus muscle pressure is exerted on the cervical nerve roots. It is easy to explain this after a whiplash injury, when the head is held as nearly immobile as possible to prevent pain (Fig. 5), and over a period of days the scalenus muscle tightens. A reflex arc then becomes established, resulting in pain and numbness. In typists, hairdressers and telephone switchboard operators a similar mechanical factor can be suggested, but in many cases no suitable explanation can be found.

A highly nervous or anxious personality [illegible] to the develop-

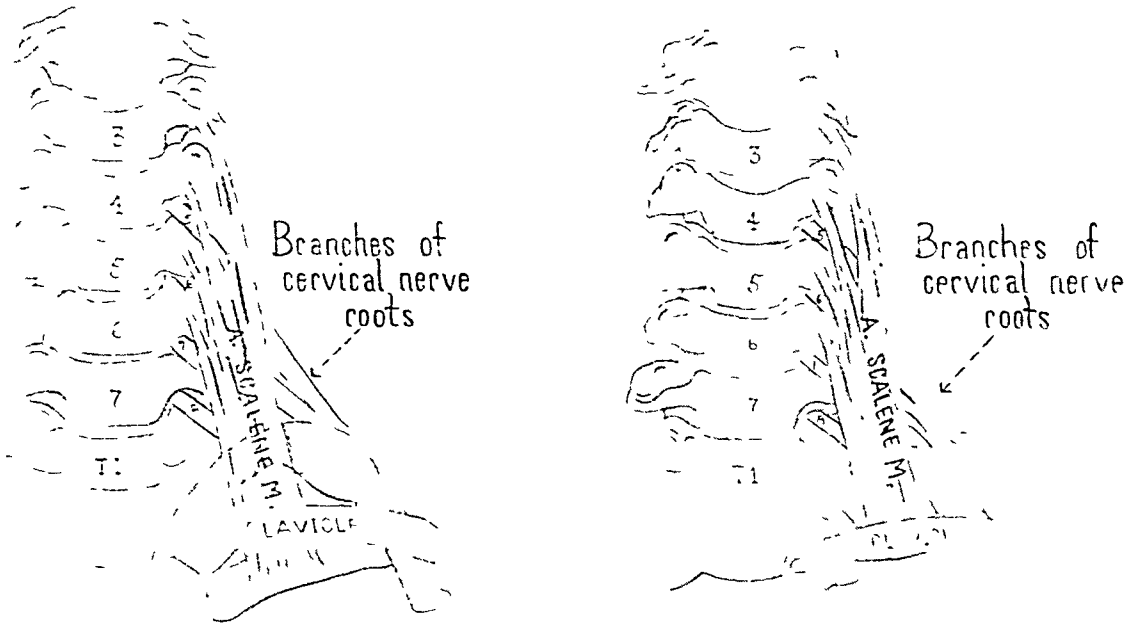

Fig. 6.—Vascular anomalies in scalenus syndrome. *Left*, aneurysm of subclavian artery secondary to scalenus syndrome (3 cases; see text). *Right*, "high-riding" subclavian artery observed in 16 per cent of cases in which treatment was surgical (see text).

ment of the syndrome. One must assume, however, that the psychoneurotic features are the whole story, as these patients become well and stay well after medical or surgical treatment.

In 8 per cent of the cases vasospastic phenomena are present in the arterial system of the upper extremity; in 2 per cent aneurysms were present (Fig. 6), and in 1 case an aberrant transverse cervical artery compressed the fifth cervical nerve root. The syndrome developed in 1 patient after bilateral prefrontal lobotomy for schizophrenia and was cured by muscle resection.

In closing, I should like to refer again to the unilateral occipital headache associated with this syndrome. It occurs in a large number of cases and is invariably cured by scalenus muscle section. Seletz has shown that pain referable to the greater auricular and occipital nerve, as well as trigeminal pain, are related thereto. Wilkins has described an auriculotemporal nerve headache that is closely related in distribution and type to the scalenus pain, and I wonder whether these pains may not have some relation. In 2 cases the petrosal neuralgia syndrome of Gardner was present, but this pain was not considered to bear any relation to the cervical nerve roots.

SUMMARY

Two hundred and thirty cases of the scalenus anticus syndrome are described, with an evaluation of the results after medical and surgical treatment. Emphasis on proper diagnostic criteria and the necessity of adequate muscle removal have been stressed. It is concluded that the scalenus

anticus syndrome is more common than is supposed, but it can be treated with gratifying results

ZUSAMMENFASSUNG

Es liegt eine Beschreibung von 230 Fallen von Kranken mit Scalenus anticus-Syndrom und eine Auswertung der Ergebnisse medizinischer und chirurgischer Behandlung vor Die Wichtigkeit sorgfaltiger Diagnostik und die Notwendigkeit einer genugend umfangreichen Entfernung des Muskels werden besonders hervorgehoben Der Verfasser kommt zu der Schlussfolgerung, dass das Scalenus anticus Syndrom haufiger vorkommt als allgemein angenommen wird, und dass es sich mit befriedigenden Ergebnissen behandeln lasst

RÉSUMÉ

230 cas de syndrôme du muscle scalene anterieur sont decrits, avec une evaluation des resultats du traitement medical et chirurgical L'auteur insiste sur les criteres d'un bon diagnostic et sur la necessite d'une resection musculaire suffisante Il conclut que ce syndrome est plus frequent qu'on le suppose, mais son traitement donne d'excellents resultats

RIASSUNTO

Vengono descritti 230 casi di sindrome dello scaleno anteriore e valutati i risultati ottenuti con terapia medica e chirurgica Si sottolinea l'importanza di una diagnosi appropriata e la necessita di rimuovere il muscolo In conclusione, la sindrome dello scaleno anteriore e piu frequente di quanto non si creda, ma puo essere curata con risultati soddisfacenti

SUMARIO

Descreve duzentos e trinta casos de sindrome do escaleno anterior, com avaliaçao de resultados apos a terapeutica medica e o tratamento cirurgico Salienta a necessidade de diagnostico exato e da adequada extirpação do musculo lesado Conclue que essa sindrome e mais frequente do se supõe porem pode ser tratada cum resultados compensadores

RESUMEN

Doscientos treinta casos de sindrome del escaleno anterior se describen con evaluacion de los resultados despues de tratamiento medico y quirurgico Un criterio de diagnostico apropiado y la necesidad de una adecuada remocion de musculo se enfatizan Se concluye en que el sindrome del escaleno anterior es mas comun de lo que se supone pero que puede ser tratado con resultados gratos

Positiveness is a most absurd foible If you are in the right it lessens your triumph, if you are in the wrong, it adds shame to your defeat

—*Sterne*

Surgical Treatment of Large Vesicovaginal Fistula

Report of a Case

S. S. PEIKOFF, M.D., F.R.C.S. (Edin.), F.R.C.S. (Can.), F.A.C.S., F.I.C.S.
AND
M. B. WALL, M.D.
WINNIPEG, MANITOBA, CANADA

IN vesicovaginal fistula, both surgeon and patient are confronted with an exceedingly grave problem. The patient is continually irritated by the perpetual leakage of urine *per vaginam*, as well as by the cutaneous excoriation produced on the vulva and the inner aspect of the thighs; worse, she is aware of the persistent odor of decomposing urine, which, she has good reason to fear, will cause her to be ostracized by those who were formerly her friends. The surgeon's share of the difficulty lies in the amount of patience and ingenuity that will be required of him if he is to prepare the affected areas for surgical intervention and determine the best approach to closure of the vaginal and vesical defects, at the same time taking all possible precautions against the occurrence of complications. The case here reported is typical of the many difficulties, major and minor, that attend the operation.

REPORT OF CASE

Mrs. M. C., aged 30, para 4, gravida 5, underwent an operation elsewhere in February 1955, for repair of a cystorectocele. Immediately afterward she became aware of vesical incontinence. Examined two weeks later, she proved to have a vesicovaginal fistula. During the next six weeks, surgical closure of the defect was attempted on three separate occasions.

She was admitted to the St. Boniface Hospital on April 19. Examination revealed the fistula to be large enough to permit the insertion of three fingers. Its edges were extremely friable, bleeding at the lightest touch. On the anterior wall of the vagina the mucosa was edematous and distorted by the repeated surgical attempts to close the defect; in addition it was covered with incrusted urine deposits. The cervix was also distorted, showing a V-shaped defect of the anterior lip (probably due to operation) and fixed in its position by scar tissue in such a manner that it could not be drawn down to the introitus with a tenaculum.

Cystoscopic examination was performed, revealing a large transverse oval aperture in the vesical floor. The left portion of the interureteral ridge and the left ureteral orifice were obliterated. After the right ureteral orifice had been identified, a ureteral catheter could be passed with ease. A considerable portion of the urethra was missing, and its distal end was distorted.

It was considered necessary to wait three or four months before operation, in order to allow time for reducing the inflammation, edema and incrustations of the vesical mucosa and to clear up the excoriated areas in the

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vulva and the inner surface of the thighs.

On April 22 an indwelling catheter was introduced into the bladder through the vagina, and the patient was kept prone on a Stryker frame for two months. (This form of treatment is capable of reducing the size of large fistulas; often it will cause smaller ones to close spontaneously.)

Cystoscopic examination was done at intervals of two weeks, with the patient under general anesthesia. By the end of six weeks the fistula had shrunk to some extent; the edges in some areas had become fibrous and no longer presented their former inflamed and edematous appearance. The fistula, at its left margin, was adherent to the left ramus of the pubis. Again the right ureteral orifice was easily identified and catheterized, but the orifice of the left ureter still could not be found at any point in the mass of granulation tissue.

The next step was to prepare the patient for operation. Hot sitz baths were ordered for the remaining excoriations of the vulva and the thighs. Irrigations of the bladder with 1:10,000 potassium permanganate solution were done, and antibiotics appropriate to the elimination of vesical infection were administered. The bladder was drained continuously through a urethral catheter attached to a Stedman apparatus. Fifteen grains of ammonium chloride was given three times a day two days a week to acidify the urine and also to prevent alkaline incrustations that otherwise might form inside the bladder and the vagina. Measures were taken to correct anemia, avitaminosis and fluid and electrolyte imbalance. A complete urologic investigation was done; this included intravenous pyelographic study, determination of the blood urea nitrogen level and tests to evaluate the sensitivity of the organisms to the antibiotics.

Operation was performed on June 24. The anesthetized patient was placed in a modified *lithotomy-Trendelenburg position*, and the labia minora were sutured to the thighs. A paravaginal incision (Schuchardt's) was made on the left side, extending downward between the anus and the ischial tuberosity. Retractors were carefully placed so as to provide adequate exposure of the fistula.

At this point the most tedious and difficult part of the operation began. It was extremely difficult to grasp the lacerated, friable cervix with a tenaculum. In order to relieve the tension on the anterior wall of the vagina, the bladder was freed from the anterior face of the cervix. The vaginal mucosa was incised around the periphery of the fistula with a curved scissors, and a line of cleavage was discovered between this mucosa and the bladder.

Curved artery forceps passed down through a so that i
shown protruding thr fi Note ed ion of
v excoriat

Beginning at the right side of the fistula, a cuff of vesical mucosa and muscle ½ inch (1.2 cm.) wide was mobilized by sharp and blunt dissection, during which there was considerable oozing of blood. The adhesions on the left margin of the fistula were fibrous and densely adherent to the left pubic ramus. These too were freed by sharp and blunt dissection, in order that the bladder adjacent to the fistula might be mobilized.

With great care not to penetrate the mucosa at any point, the cuff of vesical mucosa and muscle was inverted by means of a No. 000 catgut intestinal suture on an atraumatic needle, in a manner similar to that employed in closing an intestinal wound to make it watertight; the suture line, being inverted, was under no tension. A second layer, this time of interrupted Lembert sutures, was then placed in the muscular vesical wall to serve as a reinforcement of the first layer. The vagina was packed with gauze, and the patient was redraped for operation by the abdominal approach.

With the patient in the Trendelenburg position, a transperitoneal suprapubic incision was made in the midline, exposing the left ureter at the brim of the pelvis and revealing a moderate degree of hydroureter. An incision 1 cm. long was made in the ureter to permit urine to escape under pressure. An attempt was made to pass a ureteral catheter into the bladder but failed because of obstruction encountered in the intravesical portion of the ureter. The small ureteral incision was closed with three silk sutures.

The uterus was raised by means of a uterine tenaculum and the vesicouterine peritoneal reflection divided transversely. The bladder was completely mobilized and separated from the anterior cervical wall until the sutured fistulous area was exposed and the vaginal vault entered.

A midline incision was then made into the superior vesical wall, bisecting it down to the suture line that closed the fistulous aperture in the bladder. The left ureter was dissected free from the base of the bladder and for 2 inches (5 cm.) in the proximal direction, with preservation of a large artery entering the ureter at this point. The ureter was transected close to the base of the bladder, and its distal end was tied off with silk. Its proximal end was threaded through an opening made in the avascular area of the left broad ligament and fixed to the lower end of the vesical incision. Closure of this incision was begun at the point of entry of the newly implanted ureter and was carried anteriorly toward the apex of the bladder. At the highest point of the incision a mushroom catheter was introduced.

The suture line that closed the fistulous opening in the bladder was anchored to the uterine body with two layers of silk, one above the line and one below, so that the body of the uterus served as a firm floor for the closed fistula. Several interrupted silk sutures were employed to attach the broad ligament to the bladder in the region of the ureterovesical anastomosis. Closure of the peritoneum was executed in the anterior cul de sac. The celiotomy wound was covered with a large towel, and the patient was placed in the lithotomy position and redraped.

Closure of the gap in the vaginal mucosa created by the fistula was attempted, but the defect was too wide and was therefore left open. A temporary measure was resorted to: stitching the cervix over the vaginal defect to provide a firm base for healing. The Schuchardt incision was closed, and the vagina was packed with petrolatum gauze. A whistle-tip catheter was introduced into the urethra and attached with tape to the inner aspect of the right thigh.

The abdominal area was then redraped, and a suture of chromic catgut was passed through the vesical muscle layer and anchored to the fascia and the rectus abdominis muscle above the pubis. A Penrose drain was placed in Retzius' cavity, and the mushroom catheter was brought out at the midpoint of the cutaneous incision. Closure of the abdomen was done in layers.

Postoperative Course.—Since there had been considerable loss of blood during the operation, blood transfusions and intravenous fluids had been administered at the time. The administration of antibiotics was continued. To insure decompression of the bladder at all times, the mushroom catheter in this organ and the whistle-tipped catheter in the urethra were attached to a Stedman motor apparatus that provided continuous suction. Nurses and interns were instructed against clamping off these tubes at any time until four weeks had elapsed, i.e., until the catgut sutures had been absorbed and firm fibrous union established. (We should like to emphasize the fact that continuous decompression of the bladder is the most important single feature of postoperative care in such cases.)

During the first three postoperative days the bladder was irrigated every half hour, to

prevent blockage of the catheters by the formation of blood clots. At the end of the first week the irrigations were discontinued.

On June 26 (the second postoperative day) the vaginal pack was removed and low-pressure douches with potassium permanganate solution were started. To prevent fecal impaction, oil retention enemas were employed and liquid petrolatum was given by mouth. On June 29 the Penrose drains were removed, and on July 14 we removed the whistle-tipped catheter from the ureter. On July 15, injection of methylene blue through a suprapubic catheter showed that there was no leakage of the dye into the vagina. The mushroom catheter was removed. On July 28 an intravenous pyelogram was taken and showed both kidneys functioning normally. On August 9 the patient was discharged from the hospital.

On August 13 she was readmitted for a sterilization procedure. This was considered mandatory, since pregnancy would have resulted in irreversible damage to the left ureter and the bladder.

On August 20 the patient was again discharged, completely cured of incontinence and with good sphincteric control. She was instructed to avoid sexual intercourse for three months.

COMMENT

In reporting this case, we have in mind two highly pertinent considerations:

1. Although vesicovaginal fistula is not a common lesion, it is most distressing and and its effects are often no less than tragic; and, despite its rarity, any physician or surgeon may, at any time, find himself confronted with it.

2. Since there is not and cannot be any standardized approach to the problem it poses, all of the available literature on the subject should be studied and assessed. We shall attempt here to summarize the results of our own research on the subject.

Etiologic Factors.—Obstetric: Vesicovaginal fistula may result from the trauma of prolonged labor, owing to pressure necrosis and sloughing of the vesical wall after prolonged compression of the bladder between the symphysis pubis and the presenting fetal part.[1] This has been reduced by improved obstetric technic and by the employment of forceps at an earlier stage than was formerly customary.

Surgical: Owing to the increasing number of pelvic operations, surgical trauma today is the principal cause of this lesion, with total hysterectomy and the repair of cystocele accounting for the greatest number. This is not surprising, since these two operations involve the greatest risk to the bladder and the ureters.

Irradiative: Radium irradiation of uterine carcinoma, particularly carcinoma of the cervix, has caused vesicovaginal fistule in a number of instances, owing to the necessity of directing a canceroidal dose to the area of the base of the bladder.[2] When the carcinoma has extended into the bladder, the use of radium therapy has caused the affected vesical areas to slough away.

Miscellaneous: Less common causes include (a) tissue necrosis due to the prolonged use of pessaries or following cauterization of the cervix, and (b) tuberculosis, syphilis or lymphogranulom venereum, any of which may produce such a fistule by encroaching upon the anterior vaginal wall.

Treatment. — In 1834, Montague Gosset of London reported the first successful surgical repair of vesicovaginal fistula.[3] In 1852, in the United States, J. Marion Sims reported successful closure of such a fistula in a slave girl who had undergone a total of thirty operations. In both instances, success was attributed to the use of silver wire.

The operative management of vesicovaginal fistula has since been improved by a number of adjuvant measures:

1. A "waiting period" of four to six months for adequate healing of the tissues before surgical repair is attempted.[4] During this period many small fistulas will close, ... fistulas, by ... will

become easier to repair.[5]

2. Preparation of the tissues by adequate drainage of the bladder, the use of antiseptic irrigations and the administration of antibiotics to prevent infection.[6]

3. A tension-relieving incision of the vagina mucosa, to expose the fistulous aperture.[1a]

4. Development of a line of cleavage between the vaginal mucosa and the vesical wall, with inversion of the vesical mucosa by the initial suture and reinforcement of this suture line by one or two layers of Lembert sutures.[7]

5. Double vesical drainage and the maintenance of continuous decompression of the bladder during the postoperative period.[8]

Operative Technic: The operations most commonly performed for the repair of vesicovaginal fistula are covered in the bibliographic references at the end of this article.[9] The *vaginal approach* is most frequently employed in the initial attempts at repair; the *transperitoneal approach* is adopted when several unsuccessful vaginal procedures have left the vaginal approach impracticable because of scar tissue in the vagina.[10] Occasionally, in a "posthysterectomy case," the fistula is impossible to approach from below and the upper approach must be used. A *combination* of the two approaches, with or without reimplantation of the ureter into the bladder or the colon, may be required in extremely complex circumstances, and, as in the case here reported, may prove entirely successful.

Colpocleisis: The Latzko procedure for repair of vesicovaginal fistula included the denudation of a large area of mucosa on the anterior and posterior vaginal walls, followed by approximation of these areas to seal over or to reinforce the vesical closure. More extensive vaginal ablation may be both advisable and necessary in the repair of a large fistula in an elderly woman, since sexual function is no longer a matter of significance.

SUMMARY

The authors report a case in which an unusually large vesicovaginal fistula followed repair of a cystorectocele. The various steps in their treatment of this lesion are described and the patient's progress outlined. The operative technic employed proved entirely successful. A combination of the vaginal and the transperitoneal approach was employed.

The authors emphasize the inadvisability of attempting surgical repair until the tissues have been adequately prepared. A waiting period of three to four months was necessary, in the case here reported, to permit subsidence of edema and inflammation. They also point out that, in the immediate postoperative period, continuous decompression of the bladder by both the suprapubic and the urethral routes, is extremely important.

RÉSUMÉ

Description d'un cas de fistule vésico-vaginale de dimension exceptionnelle, après opération pour cysto-rectocèle.

Les divers stades du traitement de la fistule sont décrits. L'auteur insiste sur les dangers d'un traitement chirurgical prématuré de la fistule. Une période de 3 à 4 mois a été nécessaire pour permettre à l'oedème et à l'infection de se résorber.

Une technique combinée par voie vaginale et trans-péritonéale a été utilisée avec succès dans la réparation de la fistule.

La nécessité d'un drainage post-opératoire continu de la vessie, à la fois suspubien et uréthral, est soulignée.

RESUMEN

Un caso se reporta de una fístula vesicovaginal extraordinariamente grande

consecutiva a una reparación de cisto y rectocele.

Los varios pasos en el manejo de la fístula se describen y el progreso se menciona.

La contraindicación de la reparación quirúrgica prematura se enfatiza. Un período de espera de tres a cuatro meses fué necesario para que el edema e infección desaparecieran.

Una combinación de las vías vaginal y transperitoneal fué usado con éxito en la reparación de la fístula.

La necesidad de drenaje continuo de la vejiga y la fase postoperatoria, utilizando ambas vías la suprapúbica y la uretral, es un esfuerzo.

ZUSAMMENFASSUNG

Es wird über den Fall einer ungewöhnlich grossen Blasenscheidenfistel nach Operation eines Blasen-Mastdarmbruches berichtet.

Die verschiedenen Phasen der Behandlung der Fistel und der Verlauf werden beschrieben.

Es wird hervorgehoben, dass vorzeitige Versuche, eine Fistel chirurgisch zu schliessen, nicht ratsam sind. Im vorliegenden Falle war eine Wartezeit von drei bis vier Monaten notwendig, bis das Ödem und die Infektion verschwanden.

Zur erfolgreichen Schliessung der Fistel wurde ein kombinierter vaginaler und transperitonealer Zugangsweg gewählt.

Die Notwendigkeit ständiger Blasendrainierung nach der Operation sowohl auf suprapubischem Wege als auch durch die Harnröhre wird hervorgehoben.

RIASSUNTO

Viene riferito un caso di fistola vescicovaginale insolitamente ampia, consecutiva a una plastica per cistorettocele.

Vengono descritte le varie tamento chirurgico. Si sottolinea l'importanza di non affrontare il problema prematuramente; un periodo di attesa di 3-4 mesi è indispensabile per la regressione dell'edema e dell'infezione.

Nel caso descritto si seguì la via vaginale combinata a quella transperitoneale e si ottenne la guarigione.

Viene raccomandato l'uso del drenaggio vescivale continuo nel periodo post-operatorio, sia soprapubico che uretrale.

SUMARIO

Apresenta um caso raro de ampla fístula vésico-vaginal seguida a reparação de uma reto-cistocele.

Descreve os varios tempos no tratamento da fístula assim como os resultados obtidos.

Salienta a inconveniência das tentativas prematuras de tratamento cirúrgico de uma fístula. Diz que uma espera de três a quatro mêses é necessário para que regridam o edema e a infecção. A combinação da vias de acésso vaginal e transperitoneal são uzadas na reparação satisfatória da fístula.

A necessidade de uma drenagem contínua da bexiga no pós-operatório, utilizando as vias supra-púbica e uretral, é salienta da pelo autor.

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One of the odd effects of the importance which each of us attaches to himself is that we tend to imagine our own good or evil fortune to be the purpose of other people's actions. If you pass in a train a field containing grazing cows, you may sometimes see them running away in terror as the train passes. The cow, if it were a metaphysician, would argue: "Everything in my own desires and hopes and fears has reference to myself; hence by induction I conclude that everything in the universe has reference to myself. This noisy train, therefore, intends to do me either good or evil. I cannot suppose that it intends to do me good, since it comes in such a terrifying form, and therefore, as a prudent cow, I shall endeavor to escape from it." If you were to explain to this metaphysical ruminant that the train has no intention of leaving the rails, and is totally indifferent to the fate of the cow, the poor beast would be bewildered by anything so unnatural. The train that wishes her neither well nor ill would seem more cold and more abysmally horrifying than a train that wished her ill. Just this has happened with human beings. The course of nature brings them sometimes good fortune, sometimes evil. They cannot believe that this happens by accident.

—*Russell*

Local Débridement of the Knee in Arthritic Obese Women

DONALD S. MILLER, M.D., Ph.D., F.A.C.S., F.I.C.S.*
AND
ALVIN J. HARRIS, M.D.**
CHICAGO, ILLINOIS

THE obese, bow-legged woman in the fifth or sixth decade of life who has a painful, enlarged and functionally limited knee joint is familiar to the clinician. Genu varus may cause the rubbing effect observed between the medial femoral condyle and the medial tibial condyle, which induces the typical antalgic gait and results in a knee that reveals crepitation or even audible clicking on examination.

Roentgenograms may disclose sclerosis of the femoral-tibial joint surface with exostoses or bone spurs that show lipping at the margins; cystic areas in the subchondral region, and incongruity of the articular surfaces (Fig. 1). Less frequently, roentgenograms may reveal only minimal arthritic and degenerative changes that completely belie the severe clinical disability of the knee (Fig. 2). Soft tissues appear thicker, and the patella presents an irregular outline. Pain may be generalized but is more likely to be felt in the medial posterior and lateral knee areas. Severe pain is the symptom that brings the patient to the orthopedic surgeon.

Most arthritic knees of the type described result from local pressure. They may respond to one or more of the many available methods of physical therapy and to conservative medical treatment. Only when these efforts have failed is surgical intervention warranted. Conservative measures are herewith outlined, with operation indicated and then discussed as the last resort:

A. Medical (conservative)
   1. Weight loss (supervised)
   2. Modified rest
   3. Professional physical therapy (ultrasonic)
   4. Home physical therapy
      (a) Moist heat
      (b) Quadriceps muscle exercises
      (c) Gentle stretching or traction exercises, or both
   5. Irradiation (local)
   6. Oral medication (analgesics, steroids, lissive agents)
   7. Intra-articular injections (steroids)
   8. Circular plaster casts or molds for immobilization; braces; bandages

B. Operation (on failure of conservative methods)

This presentation, then, deals only with locally arthritic knees, usually monarticular, causing great distress as a result of associated irritation of the overlying muscle structures, fascia and ligaments. Locally arthritic knees are accompanied by the usual mild deformities of limited flexion, limited extension and loss of active-

*Attending Surgeon, Department of Orthopedics, Cook County Hospital Professor, Orthopedic and Traumatic Surgery, Chicago Medical School.
**Associate Attending Surgeon, Department of Orthopedics, Cook County Hospital; Professor, Orthopedic and Traumatic Surgery, Chicago Medical School.
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Fig. 1.—*A* (case of A. B.), medial severe spurring of tibial femoral joint, with considerable local loose body formation. *B* (case of R. R.), anteroposterior and lateral views of knee. Despite negative roentgenographic findings, considerable cartilage formation was found on surgical exposure. Cartilage appeared hypertrophied and degenerated.

passive motions of the extremity. We are concerned here only with the patient who remains persistently unresponsive to conservative treatment, who continues to suffer from intractable pain in the medial aspect of the knee joint even after trial of the newer drugs, such as Butazolidin (phenylbutazone), Cortone (cortisone acetate), Hydrocortone (hydrocortisone acetate), Delta Cortef (prednisolone), Metacorten (prednisone), and ACTH (corticotropin). Middle-aged obese women with the bow-legged deformity are the least responsive to conservative measures. The continuous synovial irritation, pressure and condylar rubbing in this mechanically inefficient joint makes the pain unbearable. After the patient has limped through the various physical therapy treatments, with weeks of immobilization of the knee by braces or casts, and has winced through a series of intra-articular injections, surgical intervention becomes the final recourse for the relief of pain. The only justification for operation in the instances described is relentless pain.

Selection of Patients.—Before any type of surgical procedure is contemplated, the surgeon must pose several questions: Has the patient undergone a careful medical evaluation as a prerequisite to operation? How well will she tolerate anesthesia? Does she have associated arthritis? Does she have associated rheumatoid arthritis, and if so, is it judicious to use spinal anesthesia? Is the cervical portion of the spine arthritic? Should endotracheal anesthesia be used? Has the patient received cortone therapy? If so, in what amount and for how long? Can she tolerate postoperative bed rest without complications of the lungs or kidneys? Has she been psychologically prepared for operation? Is an arthrotomy of the knee to be done, with or without a tourniquet? Can a tourniquet be used safely, and, if so, how should it be best handled to prevent phlebitis and pressure necrosis?

Postoperative treatment is vital to the outcome of the surgical procedure. Patients must understand preoperatively, therefore, that their help will be needed; that their cooperation will require tedious and even painful exercises. If the knee is grossly affected and disorganized and the ligaments are lax, the patient should be forewarned that the end result may be disappointing even with complete débridement and scrupulous postoperative care, during which diligent and strenuous yet gentle efforts at motion will be required, together with physical therapy and assistive devices. Such efforts may not be possible to patients over 60, when bone atrophy and associated disorders may be

deterrents to operation.

Modified Arthrotomy.—1. Induction of anesthesia with sodium pentothal and its maintenance with cyclopropane provide a satisfactory method of effecting anesthesia for these patients. Spinal anesthesia may be contraindicated because of spinal osteoarthritis; since the procedure to be recommended is short and simple, however, a spinal anesthetic is not at all necessary.

2. Preferably, a tourniquet is employed. This is contrary to Magnuson's advice, but we have found that a tourniquet properly applied has no ill effects and furthermore bleeding does not obstruct the surgeon's vision. An Esmarch tourniquet is highly satisfactory. It should be applied by spreading out the layers, with only slight overlapping, rather than by rolling layer over layer evenly, which causes "bunching up" at one site.

3. The knee is draped and flexed at approximately 90 degrees over the operating table.

4. A Krida incision, shortened to 4 inches (10 cm.), or a medial curvilinear or straight 5 inch (12.5 cm.) incision is carried from above the patella to the lower border of the condyle of the tibia to expose the fibrous and synovial portions of the knee joint capsule.

5. The knee joint is opened; the color and amount of the fluid are observed; the medial aspect of the knee is explored.

6. The patella is explored locally *without* lateral displacement and *without* removal. Although the patella is never removed, it is sometimes narrowed when the edges are freshened.

7. Contact exostosis and patellar spurs or flakes of bone attached to the patella are removed by rongeurs, not resected but properly curetted. The degenerated medial meniscus is removed, but the synovia of the knee joint is spared so that closure will not be difficult or impossible. If, however, there is local hypertrophy (Fig. 1 *A*) or

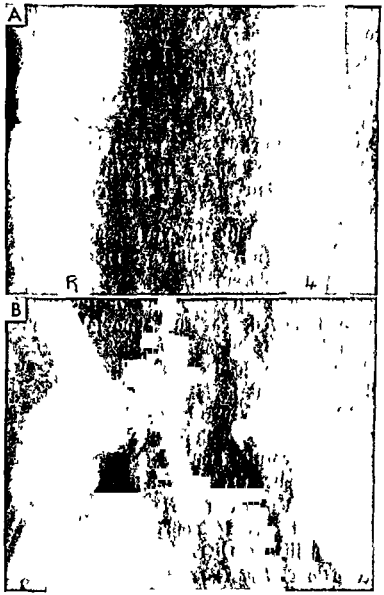

Fig. 2.—*A* (case of B. H.), anteroposterior view of knee joints indicated sharp spurring of tibial and femoral condyles, medial aspect. *B*, lateral view of knees revealing considerable exostoses and spurring of chondro-osseous junction, particularly right knee.

exostosis or pannus or scar tissue that appears to be the cause of medial pain in the knee joint, any or all of these are removed through the parapatellar incision. Osteophytes are likewise carefully chiseled away, usually along the osseochondral juncture (Fig. 1 *A*).

8. The cartilage is carefully inspected on exposure and curetted if chondromalacic. Some cartilaginous bodies cannot be seen in roentgenograms (Fig. 1 *B*) but are discovered during arthrotomy. The medial condyles of the femur and tibia are [illegible] exposure for offend- [illegible] with all other

loose bodies, are removed with chisels or rongeurs. The protruding or irregular bases of the exostoses are made flush with the surrounding bone surface. The knee joint is cleansed of bone fragments and bone sand by washing.

9. The suprapatellar pouch is explored with the index finger for joint mice, and the fat pad is removed if it is enlarged or fibrotic.

10. The articulating surfaces of the femur, tibia and patella are smoothed by chisel, rasp or curet.

11. When all offending material has been removed, careful synovial closure with interrupted snug sutures is made; fibrous layer closure is accomplished, and the knee joint is carefully extended.

12. Ace pressure bandaging is applied. In some cases mechanics' waste material can be carefully applied around the joint as a pressure dressing.

13. The sutures are removed in approximately twelve to fourteen days, sometimes a little earlier.

Postoperative Care.—The postoperative course requires absolute rest, gentle traction, local heat and plentiful use of analgesics, of which acetylsalicylic acid (aspirin) appears to be the best. The intra-articular use of hydrocortone at operation seems to reduce the amount of analgesics and sedation required. Hydrocortone, 1.55 to 2 cc., injected after closure of the joint, apparently induces a smoother postoperative course, as it did in 4 of 8 of our patients.

Early motion of the extremity, particularly of the quadriceps muscle group, is extremely important. Concurrent treatment throughout convalescence consists of the continued use of analgesics, the use of a rigid mattress for night posture, warm baths and moist heat. A heat cradle with one bulb sometimes alleviates the occasional vasospastic and neurovascular pain noticed in some patients. Simple moleskin traction of the leg (5 pounds, or 2.3 Kg.) controls muscle spasms and frequently aids in extending flexed arthritic knee joints. On the third postoperative day a wheel chair is ordered. Traction is reapplied during bed rest.

Soon after the sutures have been removed weight bearing is attempted, with firm knee bandaging. The patient is aided by a walker and later by crutches, so that in approximately three weeks after the operation she is able to bear weight with crutches or canes, which are sometimes used alternately. Patients are advised about cautious use of the limb, avoidance of stairs, the need for a slower gait, and use of a cane, possibly for an indefinite period, to relieve weight bearing.

Course.—Treatment is continued over many months. The physiotherapist encourages quadriceps muscle exercises daily, together with gentle passive and resistive exercises. Improvement occurs during this period of treatment. One cannot expect complete recovery, or even significant improvement in two or four weeks, as some contend.

Advantages. — The modified procedure suggested is better than total débridement of the joint in that there results less stiffening and greater alleviation of local pain. The incision is not long and not muscle-severing. The brevity and simplicity of this method obviate the need for a spinal anesthetic, which might be a deterrent to operation when there are associated complications.

REPORT OF CASE

B. H. (Figures 2 and 3), an obese white woman aged 57, entered the Oak Park Hospital, Illinois, because of continued pain in the knee joint, limitation of flexion and fixed extension of 165 degrees. She had been given various medicaments by mouth, and by intra-articular injection and had, on several occasions, attempted to lose weight by dieting. Diathermy, hot compresses, the avoidance of

stress and strain, and the use of several ace bandages at varying times over periods of six to nine months had been tried but pain continued and disability was prominent.

With the patient under general anesthesia, a tourniquet was applied. The medial knee joint was exposed (Figure 3) and carefully studied for exostoses, spurs and bone flakes, and these were completely removed. The patella was examined; the chondromalacic area was curetted carefully. A medial, hypertrophied patellar bone flake was removed by rongeurs. The fat pad was not disturbed in this case, but medial degenerated hypertrophied cartilage was removed. The knee joint was washed, and 2 cc. of hydrocortone was injected after closure of the capsule.

Postoperative treatment consisted of immediate traction, maintained on the extremity for two weeks. Physical therapy was instituted on the third postoperative day, at which time mild heat was applied. Gentle flexion and extension range-of-motion exercises were directed by the physical therapist. A sling beneath the knee was attached to a simple pulley system to be operated by the patient for exercises in passive flexion exercises.

On the fourth postoperative day the patient was placed in a wheel chair, with supplemental physical therapy continued. On the fourteenth postoperative day weight bearing was attempted with crutches instead of a walker. Thereafter the patient progressed to the use of a cane. Six months later she still used a cane on occasion on the opposite side, with relief of pain. An outer heel and sole shoe elevation of ¼ inch (0.6 cm.), a device frequently tried after operations for various deformities of the knee joint, also alleviated the pain.

COMMENT

Many surgeons have advocated early synovectomy for monarticular disorders of the knee joint, but Magnuson[1] was actually the first to describe débridement of this joint. He reported an overwhelming response to his technic for arthrotomy of the knee joint by wide exposure, knee flexion, excision of the entire joint and patellar displacement laterally, but without removal of the patella. This Magnuson does notwithstanding the fact that [illegible] siders this the [illegible] of severest

tion, the most frequent source of disease and the area that usually receives the brunt of injury (with the medial condyle second in frequency of pathologic disorders, and the lateral femoral condyle third).

Coonse and Adams[2] stated that they turn down the patella by means of a quadriceps tendon incision, exposing the entire knee joint. Rose[3] advocated operation for certain patients who will cooperate and expressed the opinion that procuring ex-

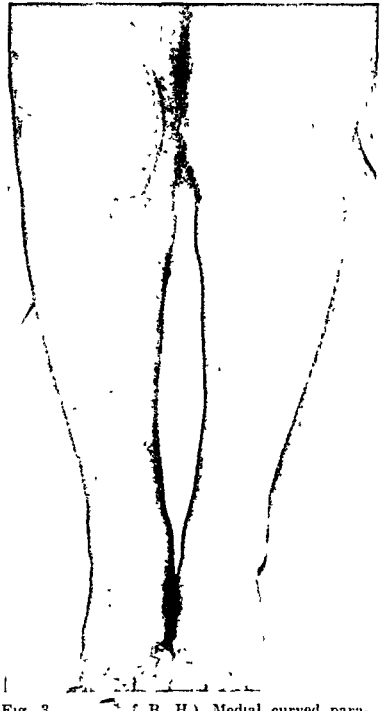

Fig. 3. [illegible] f B. H.) Medial curved parapatellar [illegible] ttured. Incision made for exposure of medial knee joint.

Obese Middle-Aged Women with Arthritic Knees and Genu Varus

Case No.	Patient	Fig.	Age	Type of Incision	Conditions Present	Observation Period	Results
1	A.B.	1*A*	60	Vertical	Degenerated medial cartilage with synovial pannus; large, thick joint; joint mice; exostoses condyles	1 year	Good; pain-free; 90° flexion of knee
2	R.R.	1*B*	62	Linear	Exostoses condyles; degenerated cartilage	1 year	120° flexion; pain-free
3	B.H.	2 and 3	57	Linear	Pannus; fat pad; thick fibrous condyles; exostosis; cartilage degenerated	6 mos.	70° flexion; pain on excessive motion
4	I.H.		58	Krida (shortened)	Large degenerated cartilage; marked fibrous pannus; exostoses of femoral and tibial condyles	4 years	Good; pain-free; 80° flexion of knee; limp
5	R.L.		60	Vertical	Degenerated cartilage; large spurs, patella and condyles	1½ years	90° flexion; pain on excessive motion
6	J.T.		52	Vertical	Torn cartilage; exostosis; femoral condyle	1½ years	40° flexion
7	L.D.		55		Old fractured tibial condyle; degenerated meniscus	1 year	110° flexion; excellent
8	J.S.		54	Curvilinear	Bone flake, patella exostoses, condyles	6 years	Good; 95° flexion

tension of the knee is extremely important after the operation. Barstow,[4] referring to Preston, suggested flexor-tendon release posteriorly for severe flexion deformity in the flexed knee joint, followed by anterior incision for exposure of the knee and resection of the knee joint for degenerative arthritis. Here, too, excision of adhesions, synovia and bone associated with a quadriceps tendon shortening was done. Haggart[5] and Isserlin[6] stated that they follow, in the main, Magnuson's technic, although Isserlin[6] has done excision with excellent results. He described 35 operations on 32 patients in which the incision was a parapatellar one. Magnuson's is a curved Krida-like incision.

One of us (D. S. M.) followed Magnuson's technic for many years without sharing his complete satisfaction. A simplified, short but adequate method for exposure of the knee joint by the medial route has been more encouraging. Either a modified vertical, a short Krida or a median parapatellar incision is made without displacement of the patella. The procedure here described perhaps derives more from Isserlin's procedure than from Magnuson's.

In the 8 cases (see accompanying table) in which this modification has been tried, pain was relieved or completely controlled. Crepitation was reduced postoperatively, and motion increased as a result of pain abatement.

SUMMARY AND CONCLUSIONS

A modified incision is suggested for relief of intractable pain of the arthritic knee with genu varus in obese middle-aged women. This communication covers the use of the procedure in only 8 cases, but the results are encouraging. The patients appear to have improved so far as pain is concerned and consequently have somewhat better functional range of the joint.

In the first 4 cases a considerably shortened Krida incision was made, which provided adequate exposure. The patella was neither removed nor displaced but was examined through the medial incision. In the second group of 4 cases a parapatellar incision was made, the knee joint was reviewed, and the offending exostoses of the patella and femoral and tibial condyles were removed. One case is reported in some detail; the others are summarized in the accompanying table.

In the selection of suitable patients the surgeon must feel assured of the patient's ability to cooperate postoperatively in tedious and even painful exercises and in cautious gradual weight bearing. The patient should be forewarned of the course. Preoperative medical evaluation is essential.

A properly applied tourniquet is advocated. Satisfactory anesthesia is provided by the use of sodium pentothal for induction and cyclopropane for maintenance. Acetylsalicylic acid (aspirin) is still the most effective analgesic. The intra-articular administration of hydrocortone on closure is at present the best medication. A ¼ inch outer sole and heel elevation of the shoe is helpful in alleviating pain and in correcting an antalgic gait.

Although the method proposed is not regarded as a panacea for the chronically painful, swollen and functionally limited degenerative knee joint, patients in selected cases may benefit by it when all conservative measures have failed. It is emphasized that operation is a last resort in such cases.

RESUMEN Y CONCLUSIONES

Una incisión de artrotomía, modificada, es sugerida para el alivio del dolor intratable de la rodilla artrítica en mujeres obesas con genu varus. La comunicación del autor presenta el uso del procedimiento en solo ocho casos, pero los resultados son alentadores. Los pacientes parecen haber mejorado con respecto al dolor y consecuentemente teniendo alguna mejoría en el grado de función de la articulación.

En los primeros cuatro casos se hizo una incisión de Krida, muy reducida, la cual dió exposición adecuada. La rótula ni se removió ni se desplazó, y se examinó a través de la incisión mediana. En el segundo grupo de cuatro casos seleccionados para prueba, se hizo una incisión pararotuliana, la articulación de la rodilla examinada y las exostosis del cóndilo rotuliano medio y de los cóndilos tibial y femoral fueron removidos. Un caso es reportado con algún detalle; se tabulan datos de los otros.

En la selección de los casos disponibles, el cirujano debe estar seguro de la habilidad de los pacientes para cooperar postoperatoriamente en tediosos y aún dolorosos ejercicios y en alzamiento de pesos cuidadoso y gradual.

El paciente debe ser prevenido de que el curso y evaluación médica postoperatorios son esenciales.

Se advoca un torniquete debidamente aplicado. El anestésico de elección es pentotal sódico y ciclopropano. El ácido acetilsalicílico (aspirina) sigue siendo el analgésico más satisfactorio. El hidrocortone intraarticular dado durante el cierre es en el presente el mejor medicamento. Una suela lateral de ¼ de pulgada ayuda para aliviar el dolor y corregir una marcha antálgica.

No obstante que el método propuesto no se menciona como una panacea para la articulación de la rodilla, degenerada, cronicamente dolorosa, edematizada y limitada funcionalmente, los pacientes en casos seleccionados pueden beneficiarse por lo tanto cuando todas las medidas conservadoras han fracasado. Se enfatiza que la operación es un último recurso en tales casos.

RIASSUNTO

Viene suggerita una incisione artrotomica modificata per alleviare il dolore del ginocchio artrico in donne obese con ginocchio varo. La comunicazione degli autori riguarda l'uso di tale tecnica in 8 casi soltanto, ma i risultati sono soddisfacenti. Si ha un miglioramento del dolore e in conseguenza anche una migliore funzionalità dell'articolazione.

Nei primi 4 casi si fece un'incisione di Krida molto breve ma tale da permettere un'adeguata esposizione della parte. Non si spostò nè si rimosse la rotula, ma la si esaminò attraverso l'incisione mediale. Nel secondo gruppo si fece, invece, un'incisione parapatellare, si controllò l'articolazione del ginocchio e si rimossero le esostosi sia del condilo mediale della rotula che dei condili del femore e della tibia. Viene riferito un caso in dettaglio, mentre gli altri casi sono stati tabulati.

Il chirurgo deve assicurarsi, quando seleziona i malati, che il paziente saprà cooperare dopo l'intervento agli esercizi noiosi e anche dolorosi e nella cauta ripresa della deambulazione. Il paziente deve essere, naturalmente, avvertito, ed è necessaria anche un'assistenza medica dopo l'intervento.

Si consiglia l'uso del laccio. L'anestetico di elezione è il pentothal e il ciclopropano. L'acido acetilsalicilico (aspirana) è ancora l'analgesico più soddisfacente. Al momento il migliore medicamento è l'idrocortone, che viene iniettato nell'articolazione al momento della chiusura. E' vantaggiosa una suola esterna di ¼ di pollice per alleviare il dolore e per correggere un'andatura antalgica.

Benchè il metodo proposto non si possa considerare una panacea nei casi di artrosi del ginocchio degenerativa cronica dolorosa con edema e limitazione funzionale, in casi scelti si possono ottenere dei benefici effetti, quando tutti gli altri rimedi si sono dimostrati inefficaci. Naturalmente in questi casi l'ultima risorsa è rappresentata dall'intervento operatorio.

SUMARIO E CONCLUSOES

Uma incisão para artrotomia modificada é proposta pelos autores que a empregam para alivio da dor do joelho artrítico das mulheres abesas com genu varus. Embora a experiência apresentada pelos aa. se refiram apenas a oito casos os resultados são animadores, com melhoria da dor e, consequentememte, da movimentação ativa da articulação.

Nos 4 primeiros casos usou uma incisão de Krida pequena obtendo uma via de acesso adequada. A rótula não foi removida nem afastada porém examinada por uma incisão medial. No segundogrupo de quatro casos selecionados para incisão justa rotuliana foi feita revisão do joelho e exérese de exostoses do condilo rotuliano medial e dos condilos femural e tibial. Descreve um caso pormenorisadamente, citando a análize dos demais.

Na seleção dos pacientes o cirurgião deve se certificar da capacidade de colaboração do doente no pós-operatório onde serão executados exercícios penosos e mesmo dolorosos alem de gradual emprego da deambulação lenta e cuidadosa.

O paciente deverá ser esclarecido dessa evolução e o controle pós-operatório que se seguirá é essencial.

Defende o uso da aplicação de torniquete. O anestésico preferido é o pentotal sódico com ciclopropana. Considera o ácido acetil-salicílico (aspirina) como o analgésico mais satisfatório. Até o momento a hidrocortisona intra-articular no momento da sutura é o melhor tratamento. O uso de palmilha ortopédica adequada é útil para aliviar a dor e corrigir posição viciosa durante a deambulação.

Embora sem considerar o método proposto como uma panacéa os casos de evolu-

ção crônicamente dolorosa, com edema e redução funcional por lesão degenerativa articular, diz que os casos bem selecionados poderão ser beneficiados quando todas as medidas conservadoras tenham falhado. Salientam que a operação é o último recurso em tais casos.

RÉSUMÉ ET CONCLUSIONS

Une incision d'arthrotomie modifiée est suggérée pour le soulagement de la douleur du genou arthritique des femmes obèses avec un genu varum. Cette communication est basée sur une expérience de 8 cas seulement mais les résultats sont encourageants, montrant une diminution des douleurs et par conséquent aussi une amélioration fonctionnelle.

Dans les 4 premiers cas les auteurs ont pratiqué une incision de Krida très raccourcie. La rotule, qui n'a été ni extirpée ni déplacée, a été examinée à travers l'incision médiane. Dans le second groupe de 4 cas, une incision pararotulienne a été pratiquée, l'articulation examinée et les exostoses du condyle rotulien médian et des condyles fémoraux et tibiaux excisés. Un cas est décrit en détail.

Dans le choix des cas favorables le chirurgien doit avertir la malade et pouvoir compter sur sa collaboration postopératoire (exercices pénibles et douloureux, adaptation prudente et progressive du poids du corps).

L'application d'un tourniquet est conseillée. Anesthésiques de choix: penthotal sodium et cyclopropane. L'acide acétylsalicylique (aspirine) est toujours l'analgésique le plus satisfaisant. Le meilleur médicament est actuellement l'hydrocortone administrée dans l'articulation au moment de la suture de la plaine. Une semelle extérieure de 1/4 d'inch aide à soulager la douleur et à corriger une démarche antalgique.

La méthode proposée ne saurait être considérée comme une panacée, mais un certain nombre de malades sélectionnées peuvent en bénéficier en cas d'échec de toutes les thérapeutiques conservatrices. L'opération ne doit être envisagée qu'en dernier ressort.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Zur Behandlung hartnackiger Schmerzen bei chronischer Kniegelenksentzundung korpulenter Frauen mit Genu varum wird ein modifizierter Arthrotomieeinschnitt vorgeschlagen. Das hier berichtete Material umfasst nur acht Falle; die Ergebnisse sind jedoch ermutigend. Die Kranken weisen, was die Schmerzen betrifft, eine Besserung auf und erreichen infolgedessen eine bessere und umfangreichere Funktion des Gelenks.

In den ersten vier Fallen wurde ein erheblich verkurzter Einschnitt nach Krida ausgefuhrt, was zu einer ausreichenden Freilegung fuhrte. Die Kniescheibe wurde weder entfernt noch verschoben, aber durch den medialen Einschnitt untersucht. In der zweiten Versuchsgruppe von vier Fallen wurde ein parapatellarer Einschnitt angelegt, das Kniegelenk untersucht und die storenden Exostosen des medialen Kniescheibenrandes und der Gelenkknorren des Oberschenkels und des Schienbeines entfernt. Einer dieser Falle wird ausfuhrlich beschrieben, die Befunde der anderen werden tabellarisch angegeben.

Bei der Auswahl geeigneter Patienten muss der Chirurg sich der Fahigkeit und Bereitwilligkeit des Kranken versichern, nach der Operation muhevolle und sogar schmerzhafte Übungen auszufuhren und eine vorsichtig zu steigernde Gewichtsbelastung auf sich zu nehmen.

Der Patient muss auf den zu erwartenden Verlauf vorbereitet werden, und die medizinische Auswertung nach der Operation ist von wesentlicher

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Narkose werden Pentothalnatrium und Cyclopropan als Mittel der Wahl angesehen. Azetylsalizylsäure (Aspirin) ist noch immer das am meisten befriedigende Analgetikum. Das beste Medikament ist im Augenblick das Hydrokorton, das beim Verschliessen der Wunde ins Gelenk eingespritzt wird. Eine Erhöhung des äusseren Sohlenrandes um 0,5 cm trägt zur Erleichterung der Schmerzen und zur Korrektur eines schmerzvermeidenden Ganges bei.

Das vorgeschlagene Verfahren kann zwar nicht als ein Allheilmittel chronisch schmerzhafter, geschwollener und funktionell behinderter degenerativer Kniegelenke angesehen werden, mag aber in ausgewählten Fällen den Kranken helfen, wenn alle konservativen Massnahmen versagt haben. Es wird betont, dass in diesen Fällen die Operation die letzte Zuflucht ist.

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The misfortunes of human beings may be divided into two classes: First, those inflicted by the nonhuman environment, and, second, those inflicted by other people. As mankind have progressed in knowledge and technique, the second class has become a continually increasing percentage of the total. In old times, famine, for example, was due to natural causes, and, although people did their best to combat it, large numbers of them died of starvation. At the present moment large parts of the world are faced with the threat of famine, but although natural causes have contributed to the situation, the principal causes are human. For six years the civilized nations of the world devoted all their best energies to killing each other, and they find it difficult suddenly to switch over to keeping each other alive.

—Russell

Plastic and Reconstructive Surgery

Plastic Correction of Gynecomastia

SIDNEY VERNON, M D , F.A C S , F.I C S
WILLIM ANTIC, CONNECTICUT

A LUMP in the breast is a matter of concern to either sex. The male breast, characterized by a tiny nipple with a surrounding pigmented areola, shows no palpable mammary tissue. When a palpable mass does occur in the male, treatment is sought from fear of carcinoma, and excision biopsy of the nodule may be done as a preventive measure. It is the duty of the surgeon who removes what often is benign breast tissue to leave no deformity caused by the operation.

Nodules may occur in the male breast because of a temporary endocrine disorder. Among prisoners of war, enlarged mammary nodules were seen in one-third When this epidemic condition began, some nodules were removed, but soon the nodule was regarded as normal and not a tumor. It occurred among the prisoners after three months of improved diet which had been preceded by a year of starvation The occurrence of the nodules after dietary improvement suggested an uneven return of endocrine function from the nonfunctional level of starvation.

Enlargement of the breast may be produced by an excess of estrogenic hormone. The excess is usually destroyed by the liver, but this function requires the presence of an adequate amount of vitamin B_1 or thiamine.

Nodules are observed in the breasts of apparently well nourished boys at puberty,

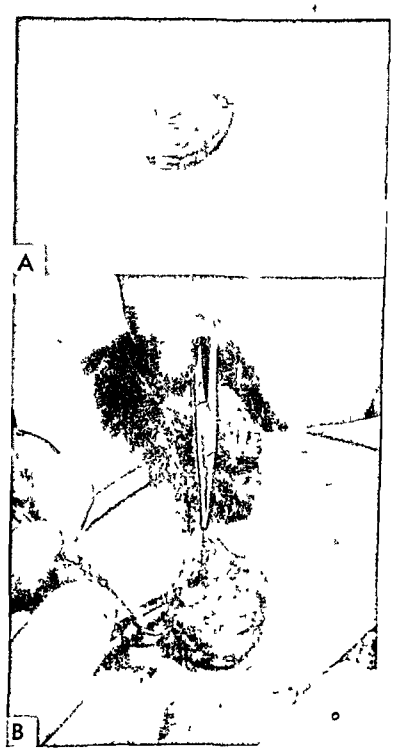

Fig 1 —*A*, semicircular incision at lo areola *B*, full skin thickness of nip o reast tissue

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Fig. 2.—*A*, breast tissue withdrawn preparatory to morcellation. *B*, final closure, with nipple sewed in place. Result will show scar of minimum visibility.

and the persistence of such nodules frequently leads to excision. Occasionally they are observed in the newborn infant, when the loss of the maternal hormones would be associated with a changing endocrine pattern. It is in the elderly man that such a nodule carries the greatest possibility of malignant change. Total excision of the male breast at an advanced age is not cosmetically important and is not associated with as much psychic trauma as it is in a young man, to whom excision of the breasts and the substitution of scars may be damaging.

For psychologic reasons also, true gynecomastia, a large female type of breast occurring in the male, homogeneously soft and without nodules, must be treated. Cosmetic removal of this large breast may be done by using the Webster circumareolar incision with morcellation. (Incision on the edge of the pigmented areola is suitable also for excision biopsy of the small nodule in the female breast.)

Technic.—At operation, a semicircular incision is made at the exact edge of the pigmented areola, on the lower side (Fig. 1 *A*). A deliberate cut is made, the scalpel held in a perpendicular plane to avoid beveling the skin. The blade is now lifted from one end of the incision to the other, and the entire thickness of the skin is traversed in the first incision.

The edges of the skin are lifted with hooks (dental picks are ideal for this purpose), and a plane of cleavage is developed between the skin and breast tissue (Fig. 1 *B*). The nipple is dissected, ducts being left attached to the skin to avoid thinning or buttonholing the nipple. Blunt dissection of the skin may begin at the lateral edges of the incision, proceeding up and out on both sides. With scissors, clamp and finger, dissection along the circumference of the breast is continued, finally approaching the nipple. Blunt and sharp dissection between the skin and the breast is continued over the lower portion.

If the breast is small it may be shelled out by blunt dissection around the circumference and on the posterior side. If it is large it must be morcellated. It is grasped at the apex with a large clamp and bisected by an incision through the main duct, made perpendicular to the chest wall (Fig. 2 *A*). Each hemisphere is bisected by another perpendicular incision made at right angles to the first. The breast may

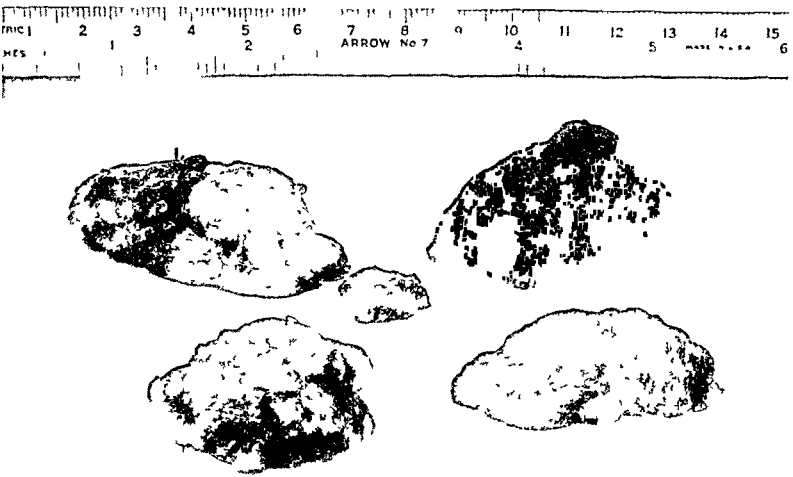

Fig 3.—Fragments of breast removed by morcellation

then be removed in four separate parts. One quarter of the breast is drawn through the incision, and dissection is continued until it is separated from the surrounding tissue Each section is dissected successively until all of the breast tissue has been removed. Bleeding is controlled with small clamps and fine ties. The nipple, which has been dissected with full skin thickness, is sewed back into place with interrupted fine cotton sutures, and a pressure dressing is applied (Fig. 2 *B*).

SUMMARY

Excision of a nodule from the male breast requires a good cosmetic result This is done with the semicircular incision at the pigmented areola devised by Webster, through which also a large breast may be removed by morcellation (Fig 3).

RESUMEN

La excisión de un nódulo de la mama masculina requiere un buen resultado estético. Esto se logra con una incisión semicircular en el area pigmentada de la aureola, original de Webster, a través de la cual también una mama grande puede ser extirpada por morcelación (Fig. 3).

RESUMÉ

L'excision d'un nodule du sein chez l'homme exige un bon résultat esthétique. Celui-ci est obtenu par l'incision semi-circulaire de l'areola mammae, technique introduite par Webster, qui permet aussi l'extirpation d'un sein volumineux par morcellement (Fig. 3).

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risultato estetico. Questo si può ottenere con una incisione semicircolare al limite della pigmentazione della areola secondo il metodo di Webster; attraverso questa incisione si può asportare anche tutta la mammella a piccoli frammenti (Fig. 3).

ZUSAMMENFASSUNG

Bei der Resektion eines Knotens aus der männlichen Brust ist ein gutes kosmetisches Endergebnis wünschenswert. Dies lässt sich mit Hilfe der von Webster angegebenen halbkreisförmigen Inzision an der pigmentierten Aureola erreichen, durch welche auch eine grosse Brustdrüse durch Zerstückelung entfernt werden kann (Fig. 3).

SUMARIO

A excisão de um nódulo da mama masculina requer um bom resultado estético, o que pode ser conseguido uzando uma incisão semi-circular, na porção pigmentada da aréola como propös. Webster, atraves a qual pode ser feita uma ampla exérese de tecido mamário (Fig. 3).

There are no correct methods in war surgery. There are established principles, but the way in which those principles should be applied varies with time, place and circumstance. The terrain in which the campaign is being fought; the climate and the time of year; the severity of the action, its success or failure, and the speed of advance or retreat: the weapons principally employed; the prevalence of disease among the troops and the state of exhaustion, dehydration, exposure, and mental strain of the soldiers when wounded: the time lag between injury and first-aid and between first-aid and arrival at an organized surgical centre; the conditions under which these centres are working, their housing, their light and ventilation, their supplies, their exposure to air attack, their complement of orderlies and nurses; the number of casualties arriving at a time; the length of the lines of evacuation, the smoothness of transport and the facilities for supervision during the journey, the spacing and adequacy of medical units on the way; the distance of the centres of definitive surgery and their establishment in beds and personnel in relation to the numbers reaching them—all these things modify the methods of the war surgeon and govern his results.

—*Ogilvie*

Benign Lymphoma of the Rectum

Review of the Literature and Report of Fifteen Additional Cases

WILLIAM W. MEISSNER, M.D., F.I.C.S.
BUFFALO, NEW YORK

THE term "lymphoma" has been adopted by pathologists to indicate any tumor of the lymphatic system, usually malignant unless further designated as benign or simple. This simple designation tends to overcome the confusing terms of the past. Benign lymphoma has also been referred to as lymphoid polyp, lymphadenoid polyp, lymphadenoma and benign giant follicular lymphoma.

Numerous classifications for tumors of lymphoid tissue have been suggested, but none has gained general acceptance.[1] Pathologists differ as to whether these tumors exist in benign form as distinct entities. Neither Kaufmann[2] nor Karsner[3] mentioned the benign lymphoid tumors. Foot[4] and also Schafer[1] considered it theoretically possible. Some pathologists[5] have classified it as a type of giant follicular lymphoma eventually becoming malignant. Finally, many clinicians and pathologists consider it a definite clinical and pathologic entity.[6]

Various writers[7] have expressed conflicting opinions as to whether benign lymphoma is a true neoplasm or merely a type of inflammatory hyperplasia. No less an authority than Ewing[6r] stated that, however obvious may be the inflammatory origin of many cases of simple lymphoma, the excessive hyperplasia, prolonged course, and often obvious idiopathic origin make the condition interesting in the field of tumors and require the recognition, especially in chronic cases, of certain features of true neoplasms.

So far as could be ascertained from a review of the literature, 235 cases of benign lymphoma of the rectum and anus have been reported since the first case recorded by Ball[8] in 1890 (see tabulation on p. 740). To these, 15 cases from my own files and those of Dr. Lester S. Knapp are added in this report, 13 of which are from the Department of Proctology of the Buffalo General Hospital.

Etiologic Factors.—The cause of benign lymphoma is unknown. Gruenwald[6d] has proposed two hypotheses: (1) that it is a tissue malformation or a congenital anomaly, and (2) that it is associated with an inflammatory process inducing hyperplasia, which may continue after regression of the inflammation. The latter concept must be supplemented by the assumption of a congenital predisposition. Hyperplasia of lymphoid tissue can be stimulated by bacteria and their by-products, which are the most common and effective stimulants, and by foreign bodies, chemical irritants and the alkaline reaction of the feces. Also, in the rectum the proximity of the crypts of Morgagni, the

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Author	Number of Cases	Year Reported
Prior to 1939	20	
Hayes, Burr and Pruit[6l]	1	1939
Gruenwald[6d]	3	1942
Smith[6j]	2	1943
Jackman[6l]	2	1947
Ehrlich and Hunter[6m]	53	1947
Li[6h]	26	1948
Miller[6g]	1	1948
Bradford[6g]	1	1948
Scarborough and Klein[6f]	6	1948
Granet[6n]	2	1949
Heller and Lewis[6c]	9	1950
Granet, Kagan and Solomon[9]	4	1950
Duperrat[6p]	10	1950
Helwig and Hansen[6k]	70	1951
Sniderman[6o]	4	1951
Hayes and Burr[6p]	22	1952
Total	236	

anal intermuscular glands, which are so commonly infected, and the rectal lymph follicles, which filter the lymph drainage from the mucosa, probably favor lymphatic hyperplasia in this region. Dukes and Bussey[10] have shown that lymph follicles occur throughout the large intestine, varying from one to seven per square centimeter and increasing from the proximal to the distal end.

Clinical Features. — Benign lymphoma occurs rarely in the colon and less rarely in the rectum. It is the most common tumor of the lymphatic system occurring in the rectum. Ehrlich and Hunter,[6m] in 1947, reviewed 813 tumors of the gastrointestinal tract in persons of military age. Of this number they reported that 363 tumors of all types occurred in the rectum and anus, 53 of which were classified as benign lymphoma. The latter were all confined to the rectum.

This tumor occurs at all ages in both sexes. Gabriel[11] reported a case in which the patient was a child aged 4 years. Heller and Lewis[6c] cited 3 cases in which the patients were children under 10. Li[6h] reported a case of this type of tumor occurring in a 71-year-old woman.

The lesions vary from a few mm. to 5 or 6 cm. in diameter. They may occur in any part of the anus or rectum and are usually within reach of the examining finger. Usually they occur singly, but they may be multiple. As a rule they are sessile, but sometimes they are pedunculated. Granet[9] reported the occurrence of benign lymphoma in identical twins, but no other familial or hereditary incidents have been reported.

Symptoms. — The symptoms associated with benign lymphoma are not characteristic and are usually attributed to concomitant pathologic changes in the anorectum. The most common symptoms reported are bleeding, protrusion or prolapse, a burning sensation or actual pain, pruritis ani, mucous discharge, and constipation, or alternating constipation and diarrhea.

Pathologic Features. — Grossly this tumor is a circumscribed, movable submucosal nodule, firm but not hard. The mucosa covering it is usually intact, movable and grayish-white to pink or red. The surface is usually papillary. In cross section the tumor is shiny, gray and lobulated.

Microscopically the tumor resembles a normal lymph node in that its normal architecture is maintained, though greatly exaggerated. The lymph follicles of the submucosa are increased in number, larger than normal and distinct, having extremely prominent germinal centers and wide collars of small lymphocytes. The germinal centers have many large lymphoblastic cells and histiocytes that phagocytize cellular débris. There is a definite increase in the number of lymphocytes in the remain-

der of the node, the interfollicular tissue being composed of packed lymphocytes and scattered reticular cells in a delicate network of reticulum fibers. The lymphoblasts of the germinal centers show a variable number of mitotic figures, and at times these may be dispersed through the interfollicular areas beyond the confines of the germinal centers. No sinusoids are present.

The tumor has no definite capsule but is surrounded by a capsule-like membrane, probably consisting of connective tissue compressed by the growth of the germinal centers and producing quite a sharp border between the lymphoid tissue and the adjacent connective tissue. Foci of lymphocytes are scattered beyond the limits of the main lesion. The lesion is essentially submucosal, but the infiltration of lymphocytes may extend into and even replace the muscularis mucosae and extend to the undersurface of the epithelium, causing it to be thinned out and thus exposed to pressure atrophy and ulceration. The infiltration of lymphocytes does *not* extend into the muscularis propria.

There are no cases on record in which benign lymphoma became malignant,[6c] and, according to Li,[6h] there is no proof that a lymphosarcoma can develop from one of these nodules. Scarborough and Klein[6f] stated that the benign lymphoma appears to bear no relation to the development of malignant change. It is lymphosarcoma, however, that the tumor resembles most closely and from which it must be differentiated. Heller and Lewis[6c] mentioned three features that simulate malignant proliferation:

1. *Destruction of the muscularis mucosae,* which they regard as a pressure phenomenon resulting from a slowly expanding lesion of the submucosa.

2. *Absence of a capsule.* Lymphoid tissues normally have a capsule, but those of the colonic mucosa normally have none, its absence in growth disorders does not have equal significance.

3. *Diffusion of the lymphoblastic cells beyond the confines of follicles.* In 2 of Heller and Lewis' cases lymphoblastic cells were noted in interfollicular areas, as were frequent mitotic figures. The growth pattern, however, did not conform to any of the well-established types of malignant lymphoid tumors, and the follicles were readily discernible.

Differential Diagnosis.—The clinical behavior of any benign lymphoma is of the utmost importance in establishing its benignity, that is, its existence for a long time without great change in size, the absence of other lymphatic involvement and a normal blood picture.

The criteria suggested for differentiation between benignancy and malignancy (Table 1) are:

1. If the lesion is benign the units of follicles have mitotic figures strictly limited to the germinal center; if it is malignant, they are scattered beyond the confines of the germinal centers throughout the tumor, and the cells are of one type, either small lymphoblasts, as in lymphosarcoma, or large cells, as in reticulum cell sarcoma.[6h]

2. Benign tumors are confined to the mucosa and the submucosa, and the predominant cells are mature lymphocytes. In the presence of a malignant tumor the infiltration spreads into or beyond the muscularis propria, and the chief cells are immature and lymphoblastic.

3. Benign lesions have many follicles with reaction centers; the normal architecture is preserved, and the cells are normal. In cases of malignant lesions the follicles are not present or are indistinct, with a diffuse infiltration of neoplastic cells, and the normal architecture is obliterated.

4. With benign tumors there are phago- histiocytes t' germinal centers;

with malignant tumors there are no such cells.

5. The growth of benign tumors is slow or stationary for long periods; that of malignant tumors is rapid.

6. In benign tumors there are no sinusoids; in malignant tumors they are numerous.

Because of these marked variations and structural changes it is of the utmost importance that a histologic diagnosis never be made on the basis of tissue taken for biopsy, but rather on the whole specimen. Furthermore, the microdiagnostician should have a working knowledge of all the facts in the case. These points have been stressed by many writers.[12] It is therefore likely that conflicting reports can be submitted by equally competent pathologists. Hayes and his associates[6i] cited a case in which varying reports were submitted by six different pathologists. Two declared the tumor to be a benign lymphoma; 1, a medullary carcinoma; 1, atypical Hodgkin's disease or possibly diffuse lymphoma, and 2, a lymphomatosis that could be expected to run a slow but malignant course.

In consideration of these intricacies and pitfalls in diagnosis and the fact that in many laboratories, even today, rectal tissue is either examined cursorily or not examined at all, it is feasible to assume that this lesion occurs much more commonly than is reported. Hayes and Burr[6p] stated that a clinical diagnosis based on digital and endoscopic examination is not difficult; they stated further, however, that in all of their 22 reported cases the tumors were accidentally discovered.

TABLE 1.—*Differential Diagnosis*

	Benign	*Malignant*
Histologic picture	Follicles with germinal centers; normal architecture preserved; cells normal	Not present or indistinct, architecture obliterater, cells neoplastic
Location	Mucosa and submucosa	Beyond muscularis propria
Mitoses	Confined to germinal centers	Scattered throughout tumor
Phagocytic histiocytes	Present	Absent
Growth	Slow or stationary	Rapid
Sinusoids	Absent	Numerous

REPORT OF CASES

CASE 1.—A 37-year-old woman complained of protruding hemorrhoids and an intermittent mucous discharge for two years, bleeding with defecation for one month, and pruritis ani. Prolapsing external-internal hemorrhoids were present. Hemorrhoidectomy with excision of the prolapse was performed. The pathologist reported three bean-sized hemorrhoids, one showing a benign lymphoma. Examination in July 1956, three years and three months after its removal, showed no recurrence of the tumor.

CASE 2.—A 29-year-old woman had undergone hemorrhoidectomy in 1945. She complained of a sensation of a "crack in the anus," burning pain and soreness upon defecation, and bleeding. Hemorrhoidectomy, with fissurectomy and excision of a rectal fibroma, was performed on May 2, 1950. The pathologist reported a polypous mass of anorectal tissue 1.5 by 1 cm., with a large aggregate of lymphoid tissue arranged in follicles, covered in part by rectal mucosa. His diagnosis was benign lymphoma. When the patient was last examined, on April 19, 1951, one year after the operation, there was no evidence of recurrence.

CASE 3.—A 32-year-old man complained of a mucous discharge, pain and "a protruding lump" occurring upon defecation for about ten years, and of occasional bright red blood in the stool for about six months. External-internal hemorrhoids and a pedunculated papilloma were observed in the right posterior rectal quadrant. Hemorrhoidectomy was performed, with excision of the papilloma, on Jan. 3, 1941. The pathologist reported one polypoid mass of tissue, 3 by 1 by 0.8 cm., from the anorectal junction, which was unusual histologically,

TABLE 2.—*Summary of Fifteen Cases*

Age of Patient	Sex of Patient	Symptoms	Number of Lesions	Pedunculated or Sessile	Site	Clinical Diagnosis	Pathologic Diagnosis	Treatment	Follow up Years
37	F	Mucus, bleeding, protrusion, pruritus	1	S	Hem ring	Hemorrhoids	Benign lymphoma	Excision	3+
29	F	Pain, bleeding	1	P	AR	Hemorrhoids, rectal fibroma	Benign lymphoma	Excision	1
32	M	Pain, protrusion, bleeding, mucus	1	P	AR	Hemorrhoids, papilloma	Lymph follicle hyperplasia? Lympho-blastoma?	Excision	7½
30	F	Pain, bleeding, protrusion	1	P	Anus	Hemorrhoids, anal polyp	Benign lymphoma	Excision	11
44	F	None, previous polyp	1	P	Hem ring	Possibly benign lymphoma	Benign lymphoma	Excision	6
34	M	Pain, protrusion, bleeding	1	S	Hem ring	Hemorrhoids	Benign lymphoma	Excision	
59	F	Mucus, bleeding, protrusion, pruritus constipation	2	S P	5 cm above AR	Adeno carcinoma	Lympho granuloma? Hodgkin's disease? Lympho-sarcoma?	Abdomino perineal resection	13
62	F	*Protrusion, bleeding*	1	P	LR	*Papilloma*	*Lymphosarcoma*	*Excision*	4
49	F	Pain, constipation, diarrhea	2	S	Hem ring	Hemorrhoids, possibly oleoma	Sarcoidosis	Excision	5½
34	F	Burning, protrusion	4	P (1) S (3)	AR	Hemorrhoids, hypertrophied anal papilla, fissure	Benign lymphoma	Excision	3½
28	M	Pain, bleeding, protrusion, pruritus	1	S	Hem ring	Hemorrhoids	Benign lymphoma	Excision	2½
35	F	Mucus, bleeding, protrusion, constipation, diarrhea	1	S	AR	Abscess, r polyp	Benign lymphoma	Excision	2½
36	*M*	*Pain, protrusion, constipation*	*1*	*P*	*Hem ring*	*Hemorrhoids, r polyp*	*Benign lymphoma*	*Excision*	
33	M	None	1	P	AR	Papilloma	Benign lymphoma	Excision	12
50	F	Pain, swelling, bleeding constipation	2	S	2 5 cm below R S	Hemorrhoids, fistula	Benign lymphoma	Excision	

AR, anorectal juncture, R S, rectosigmoid juncture, LR, lower part of rectum

having a distinctly hyperplastic lymphoid structure with large cells and uniform mitotic figures. There were two small nodules beneath the epithelium, composed of epithelioid cells with a foamy cytoplasm; diffuse infiltration of mononuclear cells; plasma cells, and eosinophils. The pathologic diagnosis was either hyperplasia of a lymph follicle or lymphoblastoma. When the patient was last examined, on Sept. 16, 1948, more than seven and one-half years after the operation, there was no evidence of recurrence.

CASE 4.—A 30-year-old woman complained of sharp pain at stool, protrusion and occasional bleeding for about six months. External-internal hemorrhoids, fissure, an anal papilloma and pectenosis were diagnosed. Fissurectomy, hemorrhoidectomy, proctotomy and excision of an anal polyp were performed on March 27, 1941. The pathologist reported a papillomatous tumor, 4 by 1.5 cm., with a pedicle 1 cm. long and 0.6 cm. wide, covered by squamous epithelium with marked focal ectasia of the subepithelial lymph vessels, giving an almost angiomatous pattern in some areas. There were moderate signs of chronic inflammation and reactive formation of lymph follicles with prominent germinal centers. The diagnosis was benign lymphoma. When the patient was last examined, on Jan. 29, 1952, almost eleven years later, there was no evidence of recurrence.

CASE 5.—A 44-year-old patient had been treated by fulguration for a small, smooth polypoid growth located just above the anorectal juncture on the left lateral wall, in an office procedure eighteen months previously. Her medical attendant had noted a rectal polyp on routine examination. She had no rectal complaints. A pea-sized mass with a short pedicle was observed in the posterior quadrant of the lower rectum. Shotty inguinal lymph nodes were palpated bilaterally. On May 28, 1950, the rectal polyp was excised. The postoperative diagnosis was "possible benign lymphoma." Pathologic examination showed a pedunculated polypous structure 1.5 cm. in diameter, having an aggregation of large lymph follicles in the submucosa, with edematous but intact epithelium covering the mass. The diagnosis was benign lymphoma. When the patient was last examined, on March 1, 1956, about six years later, there was no evidence of recurrence.

CASE 6.—A 34-year-old man complained of occasional pain, protrusion and bleeding from the anus of about five years' duration. External-internal hemorrhoids were present, and hemorrhoidectomy was performed on Feb. 16, 1942. Pathologic examination revealed a pea-sized perirectal papilloma caused by a huge solitary patch of lymph follicles in the submucosa and mucosa, consisting of six conglomerated small follicles with distinct germ centers, some of which showed considerable nuclear disintegration. The diagnosis was benign lymphoma. Two months after excision, healing was satisfactory.

CASE 7.—A 59-year-old woman complained of anal protrusion and slight bleeding, especially with a constipated stool, marked constipation for five years, and a mucous discharge and pruritus ani of one year's duration. A sessile tumor located about 5 cm. from the anorectal junction, and a polypoid tumor situated about 4 cm. from the anorectal junction were observed, and a specimen for biopsy was taken. The pathologic report was adenocarcinoma. Abdominoperineal resection of the rectum was performed on May 23, 1942, and except for disruption of the abdominal wound on the third postoperative day, convalescence was complete. The pathologist reported a nodular lesion, measuring 3.5 by 2 by 2 cm., located 4 cm. proximal to the anus and apparently growing within the wall of the rectum. Immediately distal to it was a bean-sized polyp.

Both lesions showed giant follicular hyperplasia, apparently originating in a huge submucosal lymph follicle, involving the entire wall of the rectum and replacing the muscle coat in some areas. He reported that the histologic evidence pointed more to a granuloma than to a lymphosarcoma and stated that he was unable to predict whether the development of the lesion would approach a picture resembling Hodgkin's disease or lymphosarcoma or would remain in this granulomatous state. When last examined, on March 30, 1955, almost thirteen years after excision of the lesion, the patient was well and there was no evidence of recurrence.

CASE 8.—A woman aged 62 complained of occasional slight bleeding and of having seen a "lump" protruding from the anus. A pedunculated papilloma was found in the posterior wall of the lower third of the rectum and was excised on Sept. 10, 1945. The tissue removed was a small nodule, 2.7 by 1.8 by 1.8 cm., which on section was pinkish gray in color and

resembled a lymph node Microscopically, there was a fairly uniform proliferation of small and medium sized lymphoreticular cells, resembling a lymphoblastoma The pathologist characterized the tumor as a lymphosarcoma of reticulum-cell type On July 11, 1949, almost four years after removal of the tumor, there was no evidence of recurrence

CASE 9 —A 49-year-old woman complained of intermittent bouts of colitis occurring over the past ten years, characterized by frequent soft evacuations alternating with constipation, and a dull low backache with pain in the rectum radiating to both hips The diagnosis was external-internal hemorrhoids and a sessile rectal polyp 2 by 4 cm in the right posterior rectal quadrant Hemorrhoidectomy together with excision of the rectal mass, which appeared to be an oleoma, was performed on Jan 7, 1949 The pathologist reported two polypoid structures measuring 2 1 by 1 cm , each showing large lymphoid follicles in the submucosa of normal structure There was moderate proliferation of epithelioid cells, which were arranged in a manner resembling sarcoidosis There was no follow-up on this patient, since she lived out of the state and did not return It was learned from her physician, however, that she was well and without further trouble in June 1954

CASE 10 —A 34-year old woman complained of a protruding hemorrhoid and a burning sensation of one month's duration External-internal hemorrhoids, a fissure and a hypertrophied anal papilla, the size of a cherry, located in the right anterior rectal quadrant, were diagnosed Hemorrhoidectomy, papillectomy and excision of the anal ulcer were performed on April 22, 1949 The pathologic *report included 4 polypoid structures, the two* largest measuring 1 5 by 1 cm each and the two smaller 1 by 0 5 cm All showed moderate aggregations of lymph follicles in the submucosa with the surface mucosa in a polypoid arrangement The pathologic diagnosis was benign lymphoma On Nov 21, 1952, three years and seven months after excision, there was no evidence of recurrence

CASE 11 —A 28-year old man complained of protruding, bleeding hemorrhoids with pruritus and slight pain of one year's duration External-internal hemorrhoids and a small sessile tumor, located just above the anorectal junction, were present Hemorrhoidectomy, together with removal of the tumor, was performed on May 19, 1949 The pathologist reported an aggregation of lymphoid follicles with germinal centers in the tumor and diagnosed benign lymphoma On Oct 18, 1951, two years and five months after excision, there was no evidence of recurrence

CASE 12 —A woman aged 35 complained of protruding hemorrhoids with bleeding and chronic constipation, present for some years, and of persistent diarrhea with much mucous discharge, present for about 2 months Roentgenographic examination of the colon showed colitis in the transverse and descending portions An abscess was observed in the recto vaginal septum and a fistula with an internal opening on the anterior wall at the anorectal juncture, with a surrounding indurated mass the size of a peach On Aug 29, 1938, the abscess was drained, fistulectomy was performed and the indurated mass was excised On pathologic examination the specimen from the ano rectal juncture, which measured 3 by 1 5 by 1 cm , showed chronic nonspecific inflammation and infiltration of neutrophils round cells and eosinophils, with distinct proliferation of histiocytes and lymph follicle formation in the mucosa of the rectum The diagnosis was benign lymphoma When the patient was last examined, on Jan 15, 1941 about two and a half years after the operation there was no evidence of recurrence of the tumor

CASE 13 —A 36-year old man complained of constipation, protruding hemorrhoids and pain after evacuation, all of three months' duration External-internal hemorrhoids and a pedunculated polyp of the lower part of the rectum were observed and excised on Oct 7 1936 Pathologic examination showed the bean sized polyp to consist of a huge mucosal and submucosal lymphoid follicle with large germinal centers and some proliferation of the reticulum cells The mucosa overlying the polyp showed slight atrophy from pressure The diagnosis was benign lymphoma Three months after excision of the polyp healing was satisfactory and the patient was discharged *There was no further follow-up*

CASE 14 —A physician aged 33 complained of vague gastrointestinal symptoms, but he had no anorectal complaints A hazelnut-sized papilloma was observed at the anorectal junction, this was excised and its pedicle fulgurated in March 1944 The pathologist reported benign lymphoma When the patient was last examined, in March 1956, there was no evidence of recurrenc

ASE 15.—A 50-year-old woman complained
it constipation, with pain and bleeding dur-
and after defecation, had persisted for two
irs, and that she had noticed a tender, pain-
swelling adjacent to the anus for four days.
ischio-anal abscess and small hemorrhoids
re present. The abscess was incised on
ly 11, 1956. On August 4 two small sessile
ypous structures, each 7 mm. in diameter,
uated just below the rectosigmoid juncture
the anterior rectal wall, were discovered.
ese were removed *in toto* with a biopsy for-
is, and this was followed by fulguration.
stulectomy and hemorrhoidectomy were
n performed. The pathologist reported two
all polypous fragments of tissue covered by
ormal colonic type of mucosa with a large,
pertrophied lymphoid aggregate forming a
dule beneath the muscularis mucosa of nor-
l architecture. The pathologic diagnosis
s benign lymphoma.

Summary of Cases.—These 15 cases
re encountered in three Buffalo hos-
als over twenty years. In 11 of the 15
e pathologic diagnosis of benign lym-
oma was unequivocal. In 2 the diagno-
was questionable, and in the remaining
the lesion was diagnosed as malignant.
follow-up of four to thirteen years in
ese 4 cases, however, failed to reveal any
idence of recurrence. This would seem
rule out the possibility of malignancy.
all cases the clinical pictures were re-
arkably similar (Table 2).

The common symptoms were bleeding,
esent in 10 patients; protrusion of tissue
the anus, in 10; pain, in 8; mucous dis-
arge, in 3; pruritus ani, in 3, and consti-
tion or alternating constipation and
arrhea in 4. The lesions occurred singly
11 patients and were multiple in 4, for
total of 21 lesions. Twelve lesions were
ssile and 9 were pedunculated. Their
zes varied, the smallest being 7 mm. and
e largest 3.5 by 2 by 2 cm.

There were associated anorectal patho-
gic changes in all but 2 of the 15 cases.
one of these (Case 5) there were no
mplaints. The history, however, re-
vealed fulguration of a polyp six months earlier, and the recurrent polyp was detected on routine examination. In the other (Case 7) the symptoms were due to the tumor itself. Except for the 2 instances cited, the symptoms could be accounted for by the associated pathologic conditions.

As is usually reported, the lesions were within reach of the examining finger except in 1 case (Case 15), in which the lesion was situated 2.5 cm. below the rectosigmoid juncture.

The diagnosis was not made preoperatively or postoperatively, except that in 1 case benign lymphoma was mentioned postoperatively as a possibility.

In Case 7 the pathologic diagnosis on material taken for biopsy was adenocarcinoma. Accordingly, abdominoperineal resection of the rectum was performed, and the subsequent diagnosis made from the entire specimen was possible lymphoid granuloma or Hodgkin's disease or lymphosarcoma. This patient has been followed for thirteen years without any evidence of recurrence. With this exception, all of the patients were treated by simple excision. In no case was the total leucocyte or differential count abnormal. In Case 5 a shotty bilateral inguinal adenopathic area was palpated.

SUMMARY AND CONCLUSIONS

1. Benign lymphoma probably exists as a clinical and pathologic entity. It has never been reported to recur or to degenerate into malignancy.

2. This tumor is probably more common than it has been considered. To the 236 cases reported in the literature, 15 are added in this article.

3. Although usually the picture of this lesion is characteristic, its frequent complexities and its similarity to lymphosarcoma make diagnosis difficult and justify

the dictum of Willis that "the doubtful lymph node is the bane of the microdiagnostician"

4 Diagnosis should never be attempted on the basis of material taken for biopsy but on that of the entire lesion

5 Diagnosed malignant lymphoma of the rectum, especially in those cases in which atypical features are present, should be carefully observed for confirmatory signs, such as extrarectal lymphomatosis, changes in the blood picture and recurrence after excision

6 Permanent cure is effected by simple surgical excision

SUMARIO E CONCLUSOES

1 O linfoma benigno provavelmente existe como uma entidade clinica e patologica Não foi jamais registrada sua recidiva nem degeneração maligna

2 Este tumor é provavelmente mais comum que se supõe Cita mais 15 casos deste trabalho aos 236 casos relatados na literatura

3 Embora o quadro desta lesão seja, habitualmente, quase caracteristico, sua complexidade frequente e semelhança com o linfo-sarcoma tornam o diagnostico dificil e justificam a frase de Willis "o gânglio linfatico inexpressivo e a ruina do patologista"

4 O diagnostico não deve jamais ser feito com base no exame do material obtido pela biópsia porem no da totalidade da lesão

5 Os casos diagnosticados como linfoma maligno do reto, especialmente naqueles em que estão presentes aspectos atipicos, devem ser cuidadosamente acompanhados para confirmação de sinais tais como a linfomatose extra retal, as modificações do quadro sanguineo e as recidivas após extirpação

6 A cura permanente e obtida por excisão cirurgica simples

RESUMEN Y CONCLUSIONES

1 Linfoma benigno probablemente existe como una entidad clinica y patologica Nunca ha sido reportado recurrir a degenerar en malignidad

2 Este tumor es mas comun que lo que ha sido considerado A los 236 casos reportados en la literatura, 15 son agregados en este articulo

3 Aunque usualmente lo peculiar de esta lesion es bastante caracteristica sus complicidades y su similaridad a linfosarcoma hace dificil el diagnostico y justifica el dictado de Willis que "el ganglio dudoso es la base del microdiagnostico"

4 El diagnostico nunca sera intentado en las bases de material tomado de la biopsia pero solo en ese de la lesion entera

5 Diagnosticado linfoma maligno del recto, especialmente en esos casos en los cuales rasgos atipicos estan presentes debera ser cuidadosamente observado para signos conservatorios, tales como linfomatosis extrarectal, cambios en el cuadro sanguineo y recurrencia despues de la excision

6 Cura permanente es efectuada con excision quirurgica simple

CONCLUSIONI RIASSUNTIVE

1 E' probabile che il linfoma benigno esista come entita anatomoclinica Non risulta che esso sia mai recidivato o abbia subito una trasformazione maligna

2 Questo tumore e forse piu comune di quanto si creda Ai 236 casi riferiti nella letteratura vengono aggiunti altri 15 casi descritti in questo articolo

3 Benche per solito il quadro di questa affezione sia abbastanza caratteristico, la sua frequente complessita e la sua somiglianza col linfosarcoma ne rendono la diagnosi difficile e giustificano la frase di Wills "i linfonodi sono la tomba dell'istologo"

4 La [illegible]non deve mai essere fatta

su un frammento di biopsia, ma sempre sull'intera lesione.

5. La diagnosi di linfoma maligno del retto, specie nei casi atipici, deve essere confermata da altri segni probativi come la linfomatosi extrarettale, le modificazioni ematologiche, la recidiva dopo asportazione.

6. La semplice escisione è sufficiente per ottenere la guarigione definitiva.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Das gutartige Lymphom besteht wahrscheinlich als eine klinische und pathologische Krankheitseinheit. Es liegen keine Berichte vor, dass es jemals rückfällig wird oder sich in eine bösartige Erkrankung umwandelt.

2. Wahrscheinlich ist diese Geschwulst häufiger, als man bisher angenommen hat. Den 236 im Schrifttum mitgeteilten Fällen werden in dieser Arbeit 15 weitere hinzugefügt.

3. Trotz des gewöhnlich ziemlich charakteristischen Bildes der Geschwulst wird die Diagnose häufig durch ihren komplizierten Bau und durch ihre Ähnlichkeit mit dem Lymphosarkom erschwert, und der Ausspruch Willis', dass "der zweifelhafte Lymphknoten das Verderben des Histologen ist," findet seine Bestätigung.

4. Es sollte niemals versucht werden, eine Diagnose nur auf Grund des durch Probeexzision gewonnenen Materials ohne Berücksichtigung der Gesamterscheinung der Erkrankung zu stellen.

5. Wenn die Diagnose eines bösartigen Lymphoms des Mastdarms vorliegt, besonders in Fällen, die uncharakteristische Erscheinungen aufweisen, muss sorgfältig nach Zeichen gesucht werden, die die Diagnose bestätigen, wie z.B. extrarektale Lymphomatose, Veränderungen im Blutbild und Rückfälle nach der Resektion.

6. Dauerheilung wird durch einfache chirurgische Exzision erzielt.

RÉSUMÉ ET CONCLUSIONS

1. Le lymphome bénin existe probablement en tant qu'entité clinique et pathologique. Il n'a jamais été fait mention de récidive ou de dégénérescence.

2. Cette tumeur est sans doute plus commune qu'on le suppose. L'auteur ajoute ici 15 cas personnels aux 236 cas recueillis dans la littérature.

3. Bien que le tableau de cette lésion soit en général caractéristique, sa fréquente complexité et ses similitudes avec le lymphosarcome en rendent le diagnostic difficile et justifient l'affirmation de Willis[5] selon laquelle "le noyeau lymphatique douteux est le tourment du spécialiste en microdiagnostic."

4. Le diagnostic ne devrait jamais être posé sur la base de matériel de biopsie mais sur l'ensemble de la lésion.

5. Les lymphomes malins du rectum diagnostiqués, spécialement dans les cas atypiques, devraient être observés avec soin en vue de signes confirmant le diagnostic, tels la lymphomatose extrarectale, les modifications du tableau sanguin, et la récidive après excision.

6. La guérison permanente est obtenue par l'excision chirurgicale simple.

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. . . Pessimism over the future of the world comes from a confusion between civilization and security. In the immediate future there will be less security than in the immediate past, less stability. It must be admitted that there is a degree of instability which is inconsistent with civilization. But, on the whole, the great ages have been unstable ages.

The task of a University is the creation of the future, so far as rational thought, and civilized modes of appreciation, can affect the issue. The future is big with every possibility of achievement and of tragedy.

—*Whitehead*

Thoracic Surgery

Carcinoma of the Lung with Five-Year Survival

A Study of 3,000 Cases

WILLIAM L. WATSON, M.D., F.A.C.S., D.A.B.

NEW YORK CITY, NEW YORK

THE fact that standard surgical measures today offer a patient with primary carcinoma of the lung the real possibility of cure needs to be restated, with emphasis on the fact that since 1933 many such patients have been surgically cured and have returned to their communities to become useful and productive citizens. Surgeons can point to a respectable salvage rate for resectable pulmonary carcinoma, and this fact needs to be more widely known among physicians in order to combat a somewhat pessimistic attitude brought about by the admittedly lethal nature of this highly malignant disease.

This study was undertaken in the hope that a critical review of my patients with primary carcinoma of the lungs and trachea who have survived five years or more after treatment might bring to light some information that would be valuable with regard to the ultimate prognosis of this disease. I was looking for factors that might be common to all patients whose lives have been saved. A detailed review of my experience in 3,000 cases was therefore undertaken, and it was learned that 61 patients had survived five years or more after treatment and were therefore suitable for inclusion in this report.

The search for a common denominator in this group has not proved rewarding. For instance, age and sex seem to have no bearing on curability, and the most common initial symptom, namely, cough, and its duration did not differ significantly in the surviving and the nonsurviving groups. In each case, however, the diagnosis was first suggested by the discovery of an area of increased density on the thoracic roentgenogram. The anatomic location of primary carcinoma of the lung seemingly has no bearing on its curability. No significant information regarding the cause was uncovered, and the percentage of smokers to nonsmokers of both sexes was not significantly different in the curable group.

Among the survivors there were 2 patients whose lesions were discovered accidentally by roentgenographic thoracic studies made at a time when the neoplasm was still asymptomatic. In the whole series of 3,000 cases the incidence of silent carcinoma was 3 per cent, so again there is no statistical or significant difference between the two groups.

TABLE 1.—*Types of Tumor*

Pathologic Entity	*% Resectable*
Terminal bronchiolar carcinoma	34
Epidermoid carcinoma	26
Adenocarcinoma	22
Oat cell carcinoma	12
Unclassified malignant neoplasm	6
Primary myosarcoma	100

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The pathologic nature of the carcinoma —the type of cell growth—bears a distinct relation to curability. Terminal bronchiolar or "alveolar cell" pulmonary cancer is resectable in about 34 per cent of the cases, and in the series here reported this type has the most favorable postresection prognosis

Epidermoid carcinoma, which is resectable in 26 per cent of the cases, has the next most favorable prognosis and is closely followed by adenocarcinoma, which is resectable in 22 per cent of the cases The most unfavorable type of pulmonary cancer from any therapeutic standpoint is the "oat cell" or so-called anaplastic or undifferentiated tumor, which in this series was resectable in only 12 per cent of the cases, only 1 patient with this type of cancer has remained free of disease for five years Two myosarcomas of the lung were resectable, and both patients have survived more than five years

Treatment —The methods of treatment employed in this group of 61 fortunate patients requires critical attention Until 1938 it was service policy at Memorial Hospital to treat carcinoma of the lung only by irradiation In the early years of this type of therapy relatively low voltage roentgen machines were used, and little, if any, worth-while effect on a deep-seated pulmonary carcinoma could have been obtained When the voltage was increased to 250 Kv , later to 700 and finally to 1,000, the tumor dose was correspondingly greater, and more effective restraint of growth was often obtained The degree of palliation in cases of this type is exceedingly difficult to evaluate without bias Certainly a few patients have had spectacular relief of symptoms, with control of the disease for as long as three or four years One patient was given roentgen therapy in 1933 and remained well until 1949, when he died of coronary thrombosis Three other patients (without satisfactory histologic proof of the disease) were treated by irradiation only and have survived twenty-two, twenty and ten years after the treatment Approximately 2,000 patients were treated with roentgen therapy for cancer of the lung and four have survived, a salvage rate of about 0 2 per cent

Thirty patients in whom a nonresectable pulmonary carcinoma was observed at thoracotomy were treated by implantation of the tumor with gold-filtered radon seeds The dose employed varied from 30 to 80 millicuries, according to the size of the tumor Although only 2 of these patients have survived for the required five-year period, a number of them did live comfortably for two to three years so I am encouraged and optimistic with regard to the degree of palliation obtained by this method As several of these patients are still living, apparently free of disease, it is hoped that the disease may be entirely arrested

Radioactive colloidal gold has proved useful in cases of advanced pulmonary carcinoma when recurrent pleurisy with effusion has become troublesome In 70 per cent of the patients so treated the pleural effusion has been slower to reaccumulate, and in some instances the pleural cavity has remained dry Silver-coated radioactive colloidal gold instilled into the diseased lobe of the lung through the bronchoscope has been tried in only a few cases, and the results have been unsatisfactory

Chemotherapy may have a promising future, but at this time no significant long-term survivor has come my way to justify optimism with regard to the chemicals now available for the treatment of pulmonary carcinoma Nitrogen mustard (HN_2) has the ability to bring about marked regression of the disease and relief of symptoms in cases of advanced anaplastic or

"oat cell" carcinoma of the lung. Unfortunately the remissions are brief—from three to eight months—and the chemical is not effective when repeated.

TABLE 2.—*Surgical Treatment of Carcinoma of the Lung*

1926-1955	2,967 cases
1938 (first pneumonectomy) 1938-1955	2,631 cases
Excisional pulmonary operations	305 cases

Whenever possible, wide surgical excision is the accepted form of treatment for pulmonary carcinoma in suitable cases. In 1938 the first Memorial Hospital patient with pulmonary cancer was operated upon, and he has remained well. Since 1938 and through 1955, 2,631 patients with carcinoma of the lung and of "all comers," only 305 presented themselves at a stage in which the disease permitted treatment by excision. This is an operability rate of only 11.6 per cent.

TABLE 3.—*Five-Year Survivals After Excisional Pulmonary Operations (1938-1951)*

	Survivals	*Percentage*
159 Pneumonectomies	41	25.7
23 Lobectomies	8	34.8
8 Partial lobectomies	1	12.5
190	50	26.3

For the evaluation of excisional operations for pulmonary carcinoma, 190 patients who underwent pneumonectomy more than five years ago are available. One hundred and fifty-nine of the operations were pneumonectomies, and there are 41 survivors in this group, or 25.7 per cent. Another group of 23 patients underwent lobectomy or bilobectomy, and 8 have survived more than five years—a salvage rate of 34.8 per cent. There was 1 subtotal lobectomy (for terminal bronchiolar carcinoma) out of a group of 8 such cases which was salvaged (12.5 per cent). In this operative group of 190 cases, 50 patients survived five to seventeen years after the operation, yielding an overall survival rate of 26.3 per cent.

TABLE 4.—*Operative Mortality of Pulmonary Carcinoma (1949-1955)*

	Number	*Deaths*	*Percentage*
Exploratory procedures	470	35	7.4
No resections	243	5	2.0
Resections	227	30	13.2
Radical pneumonectomies	125	17	13.6
Simple pneumonectomies	52	9	17.3
Lobectomies	45	4	8.0
Segmental resections	5	0	0

TABLE 5.—*Operations for Primary Carcinoma of the Lung (1949-1951)*

Patients with histologic proof	573
Patients laparotomized	210
Lungs resected	116

Operation		*Operative Mortality*	*5-Year Survivors*	
Radical pneumonectomy	74	4	20	27%
Simple pneumonectomy	26	2	6	22%
Lobectomy	16	3	4	25%
Total	116	9	30	26%

TABLE 6.—*Five-Year Survivals (Memorial Hospital)*

	No. Cases
Excisional pulmonary operation	50
Roentgen irradiation of lung	4
Surgery plus gold seeds	2
Carcinoma of trachea	5
Total	61

Since 1949 the policy of this hospital has been to do a radical pneumonectomy for lung cancer whenever the setting is deemed suitable. Through 1955 there have

been 125 such operations with 17 postoperative deaths—13 per cent From 1949 through the first half of 1951 and therefore suitable for 5 year evaluation at this time, there were 74 radical pneumonectomies performed and of this group 20 patients have survived more than five years (27 per cent—5-year salvage)

SUMMARY AND CONCLUSIONS

From a review of 3,000 cases it would appear that irradiation and chemotherapy should not be called on in the management of cancer of the lung, except for possible palliation Excisional pulmonary operation, when it can be successfully carried out, gives the patient a 25 per cent chance of five-year survival

A review of 61 so called cases of "cure" does not reveal a pattern or a common denominator which would set these fortunate patients apart from those who have died of their disease

For cancer of the lung, pneumonectomy is without doubt the treatment of choice, and when a radical excisional operation can be performed the patient has an improved chance of cure

RIASSUNTO E CONCLUSIONI

Da una rassegna di 3000 casi di tumori polmonari appare chiaro che l'irradiazione e la chemioterapia non trovano alcun impiego se non palliativo L'intervento demolitore, quando eseguito felicemente, consente al 25% dei malati la possibilita di una sopravvivenza per 5 anni

Uno studio di 61 casi di quelli cosidetti guariti non ha dimostrato alcun elemento che permettesse di distinguerli da quelli che morirono per la malattia

Nel cancro del polmone la pneumonectomia è senza alcun dubbio la cura di elezione, e quando la lesione sia asportata radicalmente il malato ha buone possibilita di guarire

RESUMEN Y CONCLUSIONES

De una revision de 3000 casos podria parecer que la irradiacion y quimoterapia no debian emplearse en el manejo del carcinoma del pulmon, excepto posiblemente para alivio Una operacion pulmonar con reseccion cuando puede efectuarse con exito da al paciente 25% de probabilidades de una sobrevida de cinco años

Una revision de 61 casos de las llamadas curas no revela un patron o un comun denominador que colocara a estos pacientes afortunados aparte de los que han muerto de la enfermedad

Para el carcinoma del pulmon la pneumonectomia es el tratamiento de eleccion y cuando una reseccion radical puede efectuarse el paciente tiene una probabilidad mayor de ser curado

SUMARIO E CONCLUSOES

N'uma revisão de 3 000 casos admite que a irradiação e a quimioterapia não devam ser empregadas no tratamento do carcinoma pulmonar, exceto com fins paliativos Uma ressecção pulmonar, quando bem realizada, da'ao paciente 25% de possibilidades de sobrevida por cinco anos

Uma revisão de 61 casos considerados curados não revela uma certeza ou um denominador comum que situe esses afortunados pacientes a parte daqueles que morreram pela mesma molestia

A pneumectomia e, sem duvida, o tratamento de escolha para o carcinoma pulmonar e, quando a excisão radical pode ser feita, o paciente tera uma oportunidade de cura

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Eine Nachprufung von 3000 Fallen scheint zu ergeben, dass zur Behandlung des Lungenkrebses Bestrahlungen und Chemotherapie nur fur palliative Zwecke verwendet werd ollten ine erfolgreich

ausgeführte Lungenresektion gibt dem Kranken eine 25-prozentige Chance, fünf Jahre zu überleben.

Eine Untersuchung von 61 Fällen sogenannter Heilungen weist keinerlei typische oder allgemein gültige Züge auf, die diese Glücklichen in eine andere Kategorie einordnen als die, die der Krankheit erlagen.

Die Lungenresektion ist ohne Zweifel die Behandlung der Wahl beim Lungenkrebs, und wenn sich eine radikale Resektion ausführen lässt, hat der Patient einen verbesserten Ausblick auf Heilung.

RÉSUMÉ ET CONCLUSIONS

L'étude de 3.000 cas de carcinome du poumon paraît indiquer que l'irradiation et la chimiothérapie sont contre-indiquées, sauf peut-être comme palliatif. Une excision pulmonaire, lorsqu'elle paraît pouvoir être pratiquée avec succès, donne au malade 25% de chances de survie pendant 5 ans.

Une revue de 61 cas de "guérisons" ne montre aucun type ou dénominateur commun *permettant de classer ces malades* dans une autre catégorie que ceux qui sont décédés des suites de l'affection dont ils souffraient.

Pour le carcinome du poumon la pneumonectomie est sans aucun doute le traitement de choix, et une excision radicale, lorsqu'elle est possible, augmente les chances de guérison.

It is not to be supposed that young men and women who are busy acquiring valuable specialized knowledge can spare a great deal of time for the study of philosophy, but even in the time that can easily be spared without injury to the learning of technical skills, philosophy can give certain things that will greatly increase the student's value as a human being and as a citizen. It can give a habit of exact and careful thought, not only in mathematics and science, but in questions of large practical import. It can give an impersonal breadth and scope to the conception of the ends of life. It can give to the individual a just measure of himself in relation to society, of man in the present to man in the past and in the future, and of the whole history of man in relation to the astronomical cosmos. By enlarging the objects of his thoughts it supplies an antidote to the anxieties and anguish of the present, and makes possible the nearest approach to serenity that is available to a sensitive mind in our tortured and uncertain world.

—*Russell*

Intérêt Pratique de la Spléno-portographie*

LUCIEN LEGER M D F I C S**

PARIS FRANCE

LE principe de l'opacification radiologique de l'axe veineux spleno-portal a ete etabli, sur l'animal, par Abeatici et Campi (Minerva Medica, 7 avril 1951) L'application clinique a l'homme a suivi de peu puisque, a la seance de l'Academie de Chirurgie du 23 mai 1951 (p 586 et 712 des Memoires), nous pouvions en presenter un exemple, tenant a associer a notre travail les auteurs italiens precites

Une experience de pres de 5 annees nous permet de dresser le bilan de la methode †

Rappel technique —Apres anesthesie de base par injection d'une ampoule de Nargenol et sous anesthesie locale, la rate est ponctionnee par voie sous-costale si elle est volumineuse, par voie trans-parieto-thoracique apres reperage radioscopique, dans le cas contraire

La ponction—pratiquee avec une grosse aiguille—ramene un ecoulement sanglant qui temoigne de sa reussite

A defaut d'obtenir spontanement cet ecoulement, l'injection de quelques cm³ de procaine est un moyen fidele pour determiner ce reflux sanglant

30 cm³ de diodone a 70%, ou plus, sont injectes rapidement a la seringue Un cliche est impressionne en fin d'injection

Grâce a un dispositif pour le changement rapide des cassettes, ou mieux a la camera Odelka dont nous nous servons, il y a interet a impressionner une serie de cliches qui renseigneront sur la vitesse de circulation portale et fourniront des images de repletion et d'evacuation fort utiles pour l'interpretation

Cette exploration indolore est anodine Des accidents hemorragiques ont ete signales nous même en avons exceptionnellement observe Le dosage prealable de la prothrombinemie, l'administration de thrombase, avant et apres la ponction, constituent d'utiles precautions

Surtout nous proscrivons formellement l'association d'un pneumoperitoine, dangereux car il expose a une hemorragie par la moucheture splenique que ne peut colmater le peritoine parietal separe de la rate par une couche d'air

Spleno manometrie — Prealablement a l'injection opaque, la ponction splenique permet la mesure directe de la pression portale en adaptant un manometre a l'aiguille de ponction (Lebon et Le Gô)

Une experience personnelle assez etendue nous a montre que, dans l'ensemble, la pression trans splenique etait de l'ordre de *la pression mesuree directement en cours d'operation, ou legerement inferieure*

SPLENO-PORTOGRAPHIE NORMALE — *La rate* se presente le plus souvent comme une simple macule au contact de la pointe de l'aiguille due a la diffusion du liquide de contraste et d'ou partent les branches d'origine de la veine splenique, celle ci se

*S P par abreviation

**Professor agrege a la Faculte de Medecine de Paris Chirurgien des Hopitaux de Paris

†La place qui nous est ici impartie nous interdit de longs developpements Pour plus amples details on se reportera a la monographie que nous avons publiee La Spleno-portographie (Masson editeur 1955)

Soumi pour publication le 14 Octobre 1956

porte transversalement en dedans. Le *confluent spléno-portal* ne dessine aucun reflux dans les veines mésentérique inférieure et supérieure; ce que l'on observe souvent, c'est une moindre opacification de l'origine du tronc porte qui répond à la confluence du sang mésaraïque, responsable de la dilution du liquide de contraste.

Le *tronc porte*, large de 2 cm. environ, se projette suivant une obliquité variable.

Les *ramifications intra-hépatiques* sont toujours bien visibles dans le lobe droit de l'organe, plus inconstamment pour le lobe gauche.

SPLÉNO-PORTOGRAPHIE PATHOLOGIQUE.— Si l'on songe à la richesse du réseau portal, à l'importance des organes dont il draine le sang, aux connexions que présentent ses gros troncs avec les organes abdominaux, on évoque immédiatemment les répercussions possibles de la pathologie viscérale sur les vaisseaux satellites, responsables de stase et d'hypertension portale généralisée ou segmentaire.

On concevra la fréquence de ce retentissement si l'on se rappelle que l'axe spléno-portal sur lequel se branchent les deux affluents mésentériques, prend sa source dans la rate, coule dans la vallée coeliaque avec pour berges pancréas et ganglions coeliaques, puis emprunte le lit du pédicule hépatique pour s'épanouir dans le foie.

Une lésion d'un de ces organes est susceptible de modifier le cours du flux sanguin portal, au débit rapide mais à la pression basse, ce qui rend plus sensible encore l'influence du moindre obstacle.

Au concept, jusqu'alors assez théorique, d'hypertension portale, ces explorations radiologiques ont apporté les précisions nécessaires à une meilleure interprétation et à une thérapeutique plus efficiente.

Nous étudierons successivement:

A. Les obstacles à la circulation portale et les syndromes d'hypertension et de stase portale qui en découlent.

B. L'exploration des viscères sus-mésocoliques et des grands syndromes abdominaux par la spléno-portographie.

A. OBSTACLES A LA CIRCULATION PORTALE HYPERTENSION PORTALE GENÉRALISÉE. — Schématiquement, l'obstacle responsable peut se situer au niveau du foie, au-dessus ou au-dessous le lui.

1. *Obstacle parenchymateux: cirrhose.* Les images les plus évocatrices traduisent l'existense d'un obstacle sur la circulation portale Elles dessinent, à contre courant, les veines mésentérique inférieure et parfois supérieure, coronaire stomachique et médiastinales, éventuellement veine ombilicale. Par ailleurs existe une réduction du calibre des troncs intra-hépatiques dont la ramescence se fait à angle aigu, la ramure paraissant rectiligne, rigide.

Au stade ultime s'exagère le reflux vers les collatérales cependant que s'efface la ramification intra-hépatique: il ne persiste de la ramification portale que trois ou quatre branches principales, de longueur et de calibre réduits, images d'appauvrissement vasculaire, d' "arbre mort" (Fig. 1*A*).

La circulation collatérale se développe au fur et à mesure que progresse la cirrhose, et il y a là un élément pronostique non négligeable. Peut-être peut-on trouver, dans cet aspect des cirrhose avancées, une explication à la constatation paradoxale de Hunt d'une hypertension portale plus élevée dans les cirrhoses les moins graves.

L'*intérêt diagnostique* de la spléno-portographie en matière de cirrhose est grand: nous en trouvons une preuve à propos des hémorragies digestives, que cet examen permet parfois de rapporter à une lésion hépatique méconnue. La *valeur pronostique* n'est pas moindre, comme nous l'a montré l'histoire des malades que nous avons suivis.

Dans le choix des *indications thérapeutiques* et pour poser une éventuelle indication opératoire dans certaines cirrhoses,

Fig. 1.—*A*, spléno-portographie dans un cas de cirrhose de l'enfance. Noter la pauvreté de la ramure intra-hepatique, contrastant avec l'importance de la circulation coronaire stomachique qui se poursuit vers le haut en varices oesophagiennes. *B*, de cirrhose avec une importante circulation collaterale réalisant lhier Baumgarten. On note 1. le volume de la veine splénique de la circulation collatérale supérieure par la veine coronaire stomachique et inferieure, qui contraste avec la pauvreté de la ramure intra-hépatique

la spléno-portographie ne doit pas être négligée, pouvant aider à choisir la modalité d'une anastomose porto-cave en précisant, en particulier, une thrombose associée qui, méconnue, risquerait de désorienter le chirurgien.

Le cas particulier de la cirrhose de Cruveilhier-Baumgarten procure des images particulièrement instructives: la plus grande partie du liquide de contraste fuse au travers d'une énorme veine ombilicale, détachée de la veine porte, et qui gagne l'ombilic (Fig. 1*B*).

2. *Hypertension portale par obstacle sus-hépatique:* Nous avons pu dépister un obstacle sur les veines sus-hépatiques—syndrome de Budd-Chiari—avec l'aide de la S.P., donnant ainsi sur cette maladie encore mal connue, un aperçu clinique des plus intéressant.

3. *Hypertension portale par blocage du tronc porté:* La mise en évidence, au stade clinique, de l'interruption du courant portal, constitue une des grandes acquisitions de la spléno-portographie qui révèle l'absence d'opacification du tronc porte avec stase en amont, reflux dans les racines de l'arbre portal, et développement d'une circulation de suppléance.

Multiples sont les causes d'obstacle circulatoire:

a) La *sténose congénitale* de la veine porte constitue la cause la plus habituelle d'hypertension portale chez l'enfant.

b) Les *sténoses acquises* sont le fait de l'*adulte. Elles relèvent* d'un bloc inflammatoire, reliquat d'une ancienne appendicite par exemple, ou d'un néoplasme. Ces obstructions se traduisent par un arrêt de l'opacification avec dév d'une circulation de suppléance

Ces stenoses compliquer de difficile de f

Fig. 2.—*A*, spléno-portographie dans un cas de ligature du tronc de la veine porte réalisée 15 jours auparavant. On note l'augmentation de volume de la rate, l'amputation du tronc porte, le reflux dans la veine mésentérique inférieure. *B*, spléno-portographie dans un cas de cancer du corps du pancréas. On note l'importance de la circulation collatérale péri-splénique, le défaut d'injection de la veine splénique et de la veine porte.

bose primitive avec réaction inflammatoire de périphlébite, et sténose extrinsèque compliquée de thrombose.

c) *Phlébite porte.* La spléno-portographie nous a permis d'isoler 3 variantes:

1. *Forme pseudo-cirrhotique de la pylé-phlébite:* En pareil cas, on est en droit de se demander si la cirrhose hépatique est la cause ou la conséquence de la thrombose portale?

2. *Thromboses portales post-opératoires:* Plus fréquentes peut-être qu'on ne le pense, elles pourraient expliquer certaines hémorragies digestives observées au décours d'interventions, osseuses en particulier, dont on n'a pu fournir de justification satisfaisante.

3. *Pyléphlébite suppurée:* Nous avons pu, par spléno-portographie, mettre en évidence une thrombose pariétale non oblitérante du tronc porte au décours d'une appendicite gangréneuse et assister, malgré nos efforts thérapeutiques à la constitution d'une thrombose oblitérante.

C'est à dessein que, jusqu'ici, n'a pas été prononcé le mot de Maladie de Banti. Trop d'incertitudes planent encore sur les limites du syndrome, pour que nous en fassions un chapitre spécial.

On sait que l'on tend à isoler deux sous-groupes suivant que l'obstacle siège sur le tronc portal ou au niveau du filtre hépatique. On sait aussi que l'aboutissant du syndrome est la cirrhose du foie. Il est évident que la S.P. contribuera à dissocier les obstacles extra et intrahépatiques et à préciser les indications opératoires.

Les splénomégalies à la lumière de la S.P.—Si l'on veut bien se rappeler l'absence de valvules sur le système porte, on comprend la précocité, l'importance du retentissement splénique de la moindre hypertension portale dont la rate constitue le manomètre très sensible. C'est dire tout l'intérêt de la spléno-portographie pour l'étude des splénomégalies.

L'occasion nous a été déjà fournie d'étudier l'étiologie de certaines splénomégalies, dans les paragraphes précédents. Insistons maintenant sur l'intérêt de cette exploration dans le dépistage de splénomégalies discrètes, cliniquement inapparentes et dans la recherche de l'étiologie des splénomégalies avérées.

La spléno-portographie dans les indications opératoires de l'hypertension portale.—Trop nombreux sont les cas où une splénectomie est exécutée sans contrôle radio-manométrique, où le chirurgien méconnaît une hypertension portale, justiciable d'une anastomose porto-cave. Après

amélioration temporaire, les accidents réapparaissent contraignant à une nouvelle intervention. Mais l'atrophie du moignon veineux splénique rend impossible le recours à l'anastomose spléno-rénale forçant à recourir au shunt tronculaire, non toujours possible au cas de thrombose ou de transformation caverneuse de la veine porte, ou à des anastomoses plus délicates et non toujours suffisantes, sur la veine mésentérique inférieure.

La spléno-portographie permet au chirurgien d'établir sa tactique et raccourcit l'intervention. A ce titre, elle nous paraît devoir constituer un procédé de routine avant toute splénectomie.

B. EXPLORATION DES VISCERES SUS-MÉSOCOLIQUES. — 1. PANCRÉAS—L'intimité des rapports de la veine splénique avec corps et queue du pancréas, explique que les affections de cette glande puissent retentir sur le vaisseau satellite et sur la rate. C'est ainsi que la S.P. nous a permis de diagnostiquer nombre de *tumeurs du pancréas*, méconnues par les procédés classiques d'exploration. Une *pancréatite chronique*, une *lithiase du pancréas* est susceptible aussi de retentir sur la veine splénique, frappée de thrombose et comme telle de donner une image anormale à la S.P.

Dans l'identification diagnostique, comme pour l'appréciation pronostique et opératoire des lésions pancréatiques, la S.P. joue, à l'heure actuelle, un rôle de premier plan (Figs. 2*B* et 3*A*).

2. ADÉNOPATHIES COELIAQUES — L'échelonnement des ganglions au long des veines splénique et porte, explique les déformations, voire le blocage total de ces vaisseaux que l'adénopathie soit néoplasique ou inflammatoire.

3. FOIE — a) *Métastases.* Insistons sur l'intérêt de la S.P. dans la détection des métastases hépatiques. Trop souvent l'exploration par le palper en cours de laparotomie est un leurre; il n'est d'ailleurs pas toujours loisible dexplorer le foie par le palper, dans les cas, en particulier, où le néoplasme primitif siège en dehors de l'abdomen. A plusieurs reprises, la S.P. a permis de dépister des métastases qui contre indiquent l'intervention, ou, au contraire, sont une indication à élargir celle-ci par hépatectomie (Fig. 3*B*).

b) Les *tumeurs* d'autre nature (angiome, etc.) bénéficient elles aussi de l'exploration spléno-portographique, à l'heure actuelle surtout où une hépatectomie lobaire réglée est susceptible de leur être opposée.

c) *Kystes hydatiques.* Les auteurs nord-africains ont beaucoup insisté sur les

FIG. 3.—*A*, spleno-portographie dans un cas de cancer de la queue du pancréas. Noter l'importance de la circulation intra et péri-splénique, le défaut d'opacification de la veine splénique et du tronc porte.—*B*, spléno-portographie dans un cas de cancer [illegible] tique du foie. Blocage du tronc porte par [illegible] hil [illegible] de la [illegible] de [illegible] porte. qui se d [illegible] éri-

déformations de la ramure intra-hépatique qu'entraîne le développement d'un kyste hydatique. A l'intérêt diagnostique s'ajoute une orientation thérapeutique, qui est loin d'être négligeable.

d) *Abcès.* Nous avons pu, grâce à la S.P., mettre en evidence des abcès du foie, la localisation de la suppuration présentant, pour le choix de la voie d'abord, un intérêt primordial.

C. ETUDES DES GRANDS SYNDROMES ABDOMINAUX. — 1. HÉMORRAGIES DIGESTIVES: En présence de toute hémorragie digestive inexpliquée, la splénomanométrie et la S.P. nous paraissent devoir constituer la première exploration avant l'examen baryté qui risque d'opacifier de façon gênante le champ radiologique pendant une durée non négligeable.

Ainsi nous avons pu mettre en évidence, dans un certain nombre de cas, une cirrhose du foie latente, une thrombose ancienne de la veine splénique en cours de reperméabilisation, une hypertension portale segmentaire par oblitération du tronc spléno-mésaraïque.

2. ICTERES. Nous avons déjà vu l'appoint que constitue la S.P. pour l'étude des affections du pancréas. C'est dire son intérêt dans le diagnostic des ictères, qu'il s'agisse d'une affection du pancréas, d'une lésion des canaux biliaires, ou du parenchyme hépatique, néoplasique ou non.

3. SYNDROMES DOULOUREUX ABDOMINAUX. La S.P. nous a permis d'éclairer nombre de cas de douleurs, en particulier du flanc gauche, dont la cause avait échappé à une série d'explorations radio-cliniques, dont l'origine cénesto pathique avait été évoquée et qui firent leur preuve le jour où fut mis en évidence un obstacle à la circulation spléno-portale, témoin d'un cancer du corps ou de la queue du pancréas jusque-là méconnu.

Tel est le bilan pratique actuel des enseignements de la spléno-portographie.

Nous nous sommes abstenus ici de parler des enseignements théoriques que l'on a pu en tirer, concernant le mécanisme de l'hypertension et de la stase portales, et qui nous paraissent devoir contribuer à préciser et à réformer bien des notions de la pathologie splénique, hépatique et des vaisseaux portes.

SUMMARY

Without enlarging upon theoretical details concerning the mechanism of hypertension and portal stasis, the author devotes this contribution to clarification and correction of some current ideas with regard to splenic and hepatic pathologic conditions of the liver, the spleen and the portal vessels.

Prognostic ability is born largely of pathology and patiently gathered clinical experience. It evolves even more slowly than diagnostic ability. Minute and careful clinical observation, a good visual memory, and that necessary inquisitiveness about the subsequent course of cases which is nowadays systematized in the follow-up inquiry may all be numbered among the handmaidens of prognosis.

—*Ryle*

Sección en Español

Notas Sobre el Tratamiento de la Tuberculosis Renal

ARTURO LARA RIVAS M D

MEXICO D F MEXICO

POR varios siglos, la tuberculosis fue considerada como la resultante del agotamiento organico causado por la fatiga, el alcoholismo, el hambre o la pocilga

Este concepto dio origen a bellas disertaciones clinicas y sirvio como argumento para obras Literarias mas o menos romanticas

Trece siglos antes de Jesucristo, esta enfermedad ya era conocida en la India En las escrituras de Hipocrates se menciona Los chinos la describieron 6 años antes de Jesucristo

En 1872, Koch descubre el bacilo de su nombre y Villemin contribuye con sus Trabajos a borrar de una plumada la leyenda, demostrando que la tuberculosis es una enfermedad microbiana y por lo tanto puede adquirirse como cualquiera otra, invadiendo al organismo independientemente de la posicion social o economica del individuo Desde entonces, fortalecer al organismo no es el objetivo principal, lo que se pretende es destruir el microbio El yodo, el calcio, el aceite de higado de becalao, etc , le abren paso a la tuberculina El advenimiento de los Rayos X ayudan notablemente a un mejor estudio, permitiendo diagnósticos precoces hasta entonces no logrados y dan cuenta del resultado terapéutico

La tuberculina por desgracia no logra el exito anhelado, pero al mismo tiempo la Cirurgia adelanta gracias a la asepsia y al estudio de mejores tecnicas y con poco invade el campo de la medicina La ineficacia de la terapeutica medicamentosa asi como el aparente desarrollo exclusivamente local de muchos casos de tuberculosis, contribuyó a que la Cirurgia entrara de lleno al tratamiento de esta enfermedad microbiana con grandes existos y mayores esperanzas

Lo anteriormente dicho es solo una brevisima sintesis histórica de la terapeutica de la tuberculosis Desgraciadamente el problema no esta aun resuelto asi se hayan logrado salvar muchas vidas con la cirugia, la ortopedia, la fisioterapia, o la colapsoterapia

Se ha comprobado que la tuberculosis no es una enfermedad local, sino general, que puede tener varios focos en actividad Curación clinica, no quiere decir curación completa, verdadera El individuo sigue siendo tuberculoso y le amenazan las recaidas El hecho de quitar un pulmon, o un riñón tuberculoso, no debe darnos la seguridad del exito

Las reacciones a la tuberculina siguen siendo positivas y las recaídas amenazan al enfermo [illegible] plazo

Hay que [illegible] que es u[illegible] medad [illegible]

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revelado los estudios experimentales, las investigaciones clínicas y las necroosias. El microbio penetra al organismo por la vía linfática, particularmente ganglionar, de aquí pasa al torrente circulatorio, de ahí su amplia diseminación.

El bacilo humano es el responsable de la mayoría de los casos; penetra usualmente por las vías respiratorias. Es mXs frecuente en los jóvenes.

El bacilo o ino es más común en los niñós, es la causa principal de las adenitis u el tracto intestinal es la ruta principal.

La tuberculosis genito-urinaria es pues, secundaria a una localización ganglio-pulmonar, siendo el riñón el más a menudo infectado.

Salvo excepciones, la primo infección es benigna; pasado el período agudo, el enfermo se recupera completamente, siguiendo una fase silenciosa más o menos larga, dependiendo de la edad, de la intensidad de la primo infección y de las defensas orgánicas del individuo. La tuberculosis urinaria se presenta en una segunda fase de actividad que es la llamada de diseminación, la que de ordinario se presenta cuando el organismo por equis motivos disminuye su resistencia. De aquí pues, que la terapéutica no se debe limitar a la destrucción del microbio, sino tambien a mejorar las condiciones generales del enfermo. Vida y trabajo acondicionado, mejor alimentación e higiene, son factores valiosos. La inspección de los animales y la pasteurización de la leche, ha hecho notable la disminución de casos en nuestros centros hospitalarios. No es exagerado anotar que: la tercera parte de las nefrectomías que se hicieron en el Pabellón 5 del Hoapital General de México, de 1926 a 1930 fueror debidas a tuberculosis renal. La Pasteurización de la leche se hizo obligatoria en México desde 1930, teniendo desde esa fecha una nivel menor de tuberculosis renal en el Servicio de Urología. Esto no modificó nuestro criterio y conducta a seguir de entonces, que por lo demás creo era universal. Hacer un diagnóstico precoz, poner en reposo al enfermo, dar a su organismo el máximo de vigor, suministrarle además de adecuada alimentación, productos químicos o biológicos para tonificarlo, así como específicos contra el bacilo; en cuanto se lograba mejorar el estado general, hacer quirúrgicamente la erradicación del foco en actividad, en este caso el riñon, condición indispensable entonces para la curación del enfermo. Si al mismo tiempo que se encontraba una lesión incipiente de riñon, se descubría en otro órgano otra lesión tuberculosa en mayor actividad, se daba preferencia al tratamiento de esta última y una vez apagada esta última lesión, se trataba la del riñón.

Recuerdo el caso de un paciente del sexo masculino, de 38 años, que ingresa al Servicio de Urología por irritabilidad vesical, frecuencia y dolor de las micciones y hematuria. La Urografía excretora reveló una ligera lesión tuberculosa en el cáliz superior del riñón derecho y el cateterismo dió baciluria de ese lado. El estudio del aparato respiratorio acusó una caverna pulmonar en el vértice del pulmón derecho y gran cantidad de bacilos en el esputo. Fué enviado al Servicio de Tuberculosis pulmonar en donde se le practicó frenicectomia, neumotórax y una cura sanatorial durante 8 meses. Desaparecieron los bacilos en el esputo y el enfermo aumentó 12 kilos.

En estas condiciones fué regresado al Servicio de Urología, en donde neuvas urografías acusaron que le lesión incipiente vista 8 meses antes, había avanzado grandemente, observándose no solo gran destrucción del cáliz superior, sino tambien del medio. Tal parecía que la cura sanatorial y demás tratamiento para la lesión pulmonar en nada lo habían mejorado. Fué interesante tambien ver qué, por la frenicectomía, el riñón había sido jalado con el diafragma hacia arriba.

Le fue practicada luego la nefrectomia lograndose una cura espectacular, pues pronto desaparecieron todas las molestias urinarias

Por espacio de 3 meses fue retenido el paciente en el Servicio, granado 6 kilos mas de peso; pero sintiéndose muy mejorado exigió su alta Regreso a sus labores suspendiendo los cuidados aconsejados

Mes y medio despues reingreso al Servicio, muriendo el mismo dia, por meningitis tuberculosa

En contra de la opinion de Albarran, las experiencias fueron demostrando que es un error operar de inmediato, que es preferible preparar al enfermo suficientemente y seguir su atencion en el inmediato y lejano post-operatorio

Hasta hace poco, el tratamiento de la tuberculosis renal de mayor acción era el quirurgico, el tratamiento medico, era secundario

Con el advenimiento de la estreptomicina, declinó la tuberculosis renal, por lo menos aparentemente Su eficacia se hizo evidente impresionando a todas Las primeras dosis hicieron desaparecer en forma dramatica el dolor, la polaquiuria, la fiebre, etc Esto trajo como consecuencias un cumulo de esperanzas, asociadas a no pocas dudas

Surgieron preguntas que solo el tiempo podria contestar ¿La estreptomicina cura la tuberculosis general, la renal y genital, o es un simple alivio pasajero?—¿Mejora el pronostico inmediato y lejano de las intervenciones?

Junto a los exitos maravillosos de varios casos que no requirieron operacion, se sumaron los múltiples fracasos de curacion con simple estreptomicina, de ahi que la cirugia siga siendo el tratamiento de elección

Es indiscutible que los antibióticos, asociados a la cirugia acortan el post-operatorio, disminuyendo los peligros de generalizacion y la mortalidad operatoria

M S C de 30 años, es tratado por medico general en Septiembre de 1949, con altas dosis de penicilina por uretritis gonococica y epididimitis Esta ultima no mejora y se abre a la piel convirtiendose en fistula revelde Este enfermo me es enviado para su tratamiento (en octubre inmediato) encontrando bacilo de Koch en varias muestras de orina Marcada majoria con estreptomicina y rimifon Se le practica epididectomia el 28 de octubre

En marzo de 1950 se le practica nefrectomia por Litiasis y tuberculosis renal Controlado periodicamente ha logrado un buen estado general, ausencia total del bacilo de Koch y molestias, hasta la fech

Despues de la estreptomicina surgen nuevos elementos contra el bacilo destacandose por su mayor actividad el P A S y la hidracida Han sido usado solos o combinados, lograndose mayor numero de curaciones en esta ultima forma

Se ha comprobado que la estreptomicina y el P A S no son bactericidas, sino bacteriostaticos, detienen la evolucion de la enfermedad y la multiplicacion del bacilo que facilita al organismo intervenga con sus medios de defensa para la curacion Hacen mas eficaces las nefrectomias sobre las lesiones vesicales Permiten las nefrectomias parciales, pero su eficacia esta subordinada a la sensibilidad del sujeto

Respecto a las nefrectomías parciales que con tanto entusiasmo se estan practicando actualmente, no tengo experiencia, la sola posibilidad de dejar un foco que obligue posteriormente a una nefrectomia muy laboriosa y demasiado expuesta, me ha impedido practicarla, las considero muy justificadas en casos de riñon unico

La disminucion de casos de tuberculosis renal que con el uso de los antibioticos y la quimioterapia pareció haberse logrado al principio, se ha comprobado estadisticamente que fue solo aparente Lo que si es real, es que los casos quirurgicos han disminuido

No es aventurado pensar que pronto la cirurgía será desplazada totalmente del tratamiento de la tuberculosis renal.

Lattimer y colaboradores, en su última comunicación de este año, nos dicen haber usado durante un año, la triple droga: estreptomicina, P.A.S. e isoniazida en 20 pacientes que sufrían severas lesiones cavitarias de riñón con orinas cargadas de bacilos tuberculosos.

El éxito fué tal, que no fué necesaria la extirpación de ningún riñón tuberculoso o porción del mismo, en los últimos tres años.

La administración de las drogas se ejecutó de la siguiente manera:

Un gramo de estreptomicina 2 veces por semana; 100 mg. de isoniazida 3 veces al día y 5 gms. 3 veces al día de P.A.S.; todo esto simultáneamente y durante un año.

Cuando se quiere proceder quirúrgicamente, se practica durante un mes, una cura con los 3 medicamentos y despues de la operación se continúa el tratamiento por 11 meses.

Para el buen éxito de este tratamiento es indispensable que el enfermo guarde cama por espacio de 6 a 12 meses; que se discipline a tomar sus medicamentos en la forma aconsejada sin omitir ninguna dósis, al mismo tiempo que se le tonifica.

Esta terapéutica usada ha dado los resultados siguientes:

39% de éxitos usando estreptomicina sola por 120 días.
60% de éxitos usando isoniazida sola por 1 año.
93% de éxito usando estreptomicina y P.A.S. por un año.
100% de éxito usando las tres drogas por un año.

La valorización de estos nuevos métodos, ya sean solos o asociados a los antiguos, estará basada en una prolongada observación.

Lo solución plenamente satisfactoria de la tuberculosis renal parece estar muy cerca; entre tanto, es muy satisfactorio, (despues de tanto luchar por la vida de estos pobres enfermos) ver como se recupera con mayor rapidez y que su vida, además de ser confortable, se prolonga más.

SUMMARY

The author presents a brief history of renal tuberculosis, which has been known as a pathologic entity since ancient times. He points out that, with certain exceptions, the primary infection is generally benign; its progress depends, among other factors, on the resistance of the individual patient.

Various prophylactic and therapeutic measures are discussed, including sanitation and the inspection of milk, medical treatment and surgical intervention. It is pointed out that operation, if employed, should not be performed too hastily; an adequate period should be allowed for meticulous preparation of the patient. The advent of the antibiotic era has greatly improved the surgical prognosis.

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Those who were in the first world war will remember the 'stand to' in the front trenches an hour before dawn, the hour when mists and half shadows conceal familiar objects, the hour when the enemy may creep unseen, when a suspicious alertness is the only way to safety We should all 'stand to' over our patients who have passed the forty mark, suspicious of the enemy who may even then have established a footing unknown We should beware of the man who starts to look ill to get a little paler, to lose weight, to turn down the second round of golf, or the last rubber at bridge, to miss his second helpings, and to become 'choosy' about his diet The mind or body of a healthy man does not tire suddenly and perceptibly be he forty or four score Habits of meals and bowels do not change without reason, but it is the neurotics who look at their faces and tongues daily in the mirror and weigh themselves weekly, and with normal men we have to rely on our own observations or the reports of their wives and friends To start with we keep our suspicions to ourselves, for we do not wish to earn a name for being alarmists or to involve our patients in needless expensive investigations, but we must keep a constant watch on the deviation we have noticed, and we should start a weight chart

Cancer is progressive, the paleness increases, the tiredness gets worse, the weight continues to fall And there are certain tests we can carry out without revealing our suspicions And we can put them on a meat free diet and have a stool examined for blood, a negative result makes a cancer anywhere in the alimentary tract very unlikely But if symptoms continue and progress, if we see that slight but steady deterioration that whispers 'cancer' to the trained eye, we must insist upon a complete investigation We may be wrong, but if we always wait till we are right we shall always be just too late A live mistake is better than a dead certainty

—Ogilvie

Editorials

Civilization — or Chaos

THE auotographed letter that accompanies this editorial, written on the occasion of Thomas Jefferson's election to a scientific organization as a "foreign associate for the class of moral and political sciences," strikes the identical keynote that resounded at the founding of the International College of Surgeons: the principle that science has no fatherland but belongs to all mankind. A corollary, equally familiar to Fellows of the College, was postulated by Jefferson when he wrote of "the brotherly spirit of Science, which writes into one family all its votaries of whatever grade, and however widely dispersed through the different quarters of the globe."

Although neither the concept of the universality of science nor the hope of eventual world-wide fraternity was new when the College was conceived, we were pioneers in the effort to bring these great ideas into visible form; to give them, so to speak, "a local habitation and a name." It was borne in upon us then that no words in any language, however majestic, can compel men's hearts and minds unless there is action behind them. We undertook this action. We took upon ourselves the colossal task of transmuting ideals into actuality. In the years through which we have labored to this end there is ample evidence that our goals are authentic and can be reached, though God alone knows after what expenditure of time, devotion and endurance.

There is ample evidence, too, that up to this point in our progress we have done well. Within the College both purposes have been achieved, and outside the College, we are increasingly sure, the effect has been steadily more noticeable.

Nevertheless, there is much in the world today to trouble—nay, even appal—any man of good will, be he surgeon or layman. We are confronted with a gigantic contradiction. Never before have men spoken so freely and constantly of the brotherhood of man, and it is natural to find hope in the mere fact that so idealistic a phrase, with such far-flung implications, has become a household word. One would suppose, had life not given one so intimate an acquaintance with the sons of Adam, that the mere conception of ultimate universal fraternity would set the world afire with longing to achieve it, but no; those who share this longing may achieve a torchlight procession, but they are all too likely to be interrupted in the midst of it.

Speaking of the sons of Adam, it is ironic to recall that Adam's first two sons —according to the Judaeo-Christian tradition the first pair of brothers to be born into this wilful world—were destined to become the perpetrator and the victim of the world's first deliberate murder. Cain slew his brother Abel because he was jealous of him; with no better motives, and with some even worse, the sons of Cain continue to slay their brothers today in body, mind and soul—by cunning, by violence, by trickery, by oppression, by imprisonment, by exile, by torture, by deprivation, by greed, by the lust for power and conquest and, in some instances within the memory of this generation, by an obscene travesty of scientific experiment.

Within a bare half century we have seen whole national civilizations invaded, destroyed, changed beyond recognition, the recurrent disease we thought we had under control; naked, primitive savagery which apparently lurks so close to the surface that with all the knowledge and experience we have gained we are helpless to control it. One wonders sometimes whether the word civilization" in some quarters would not be more aptly labeled 'superficialization'." The suggestion is [illegible] for indeed there are many points of likeness between [illegible] militarism and war and the [illegible] dread disease. It

Citizens President and Secretaries

I have received [illegible] announce to me that the [illegible] elected me a foreign associate [illegible] sciences and I receive [illegible] expression of respect from a body [illegible] calculated to inspire [illegible] qualifications which might do justice to the appointment I accept it as an evidence of the brotherly union of Science which unites into one family all its votaries of whatever grade and however widely dispersed through the different quarters of the globe

Accept, Citizens President and Secretaries for yourselves and your associates, the assurance of my high consideration and respect.

Th Jefferson

Washington Nov 16 1802

The original autographed letter of Thomas Jefferson that appears in facsimile above is from the private collection of the Editor, now the property (by gift) of the International Surgeons' Hall of Fame, 1524 Lake Shore Drive, Chicago

would be ironic indeed if, after all the centuries of struggle toward something higher and better, our hard-won civilization should die of creeping paralysis as a result of betrayal by sadistic spirochetes in human form.

Cain's example has been only too well followed. The word "brotherhood" has come to be a symbol of unity, harmony and love only because of these other exemplars —it is surprising, after all, how many we have had—who set us better examples by being or becoming brothers and saviors of their fellow men. They are confined to no one religion, to no one race. They include the poets and prophets, the healers and helpers, the teachers and philosophers all down the ages and in every nation. These builders and upholders of civilization differed astronomically in their several personalities, their teachings, their convictions and their ways of serving mankind, but they had two things in common: *total disregard of self and self-interest* and the *passion and insight engendered by solitary, individual thought.*

Of these two priceless assets the world is rapidly being drained. It would seem that some reject self-sacrifice as neurotic. Yet, in the not too distant past, humility, self-forgetfulness and vision made a man consider his life well spent if it spurred only a handful of humanity along the upward path. Multitudes need endoctrination in that direction today.

It may seem paradoxical and, in these times, even heretical to suggest that a little less gregariousness, a little less dependence on group ideologies and a little more effort to achieve solitary thought might bring men closer to brotherhood than will the current overinsistence on association and consultation. A man must know himself before he can help others. It takes time, thought and courage even to approach an understanding of oneself, let alone an understanding of human motives, including the primal, barbaric rests that lurk in the shadows of man's consciousness. No easy generalization will cover the world situation as it is today. No opinion picked up from this group or that conference or the other national culture has any value, for opinion is worthless until it becomes conviction, and conviction is the business of the solitary human soul; it cannot be adopted, it must be generated.

No reasonable man would deny the potential value of association, conference and organization. In themselves these things are good. Modern man's tragic error is the assumption that they can bring order out of chaos, peace out of war, and brotherhood out of primal suspicion and hostility. This will require not organization but inspiration, and inspiration of a very high order. The world today is a living, dying, suffering, fighting, intransigent pictorial illustration of the ancient truth, "where there is no vision, the people perish." Despite all the talk and all the striving, we are still very far from brotherhood. Some of our "brothers" must still be kept at bay—a disheartening but inevitable conclusion—until they have seen the light. The dead hand of theory cannot kindle the spark. We venture to predict that when the light shines at last it will be upheld by the hand of inspiration, a hand that has traced the pattern alive and alone.

—M. T.

Pre-Hispanic Medicine in Mexico

HISTORICAL records of the lives and times of the aboriginal inhabitants of Mexico indicate that they had no conception of medical and surgical practices as modern physicians conceive of them Nevertheless the aborigines, like other primitive peoples, had diseases and were sometimes injured, and they were well aware that both diseases and injuries stand in need of treatment They had some inkling, therefore, however vague, of the two vast fields of scientific knowlege now called pathology and therapeutics In the natural manner of all primitive societies, they construed the misfortunes of nature as emanating from the supernatural and presumably hostile forces they most feared, and saw to it that a god or gods of medicine and healing entered their Pantheons These gods they worshiped and did their best to appease by means of the usual rites that attended the cults of such wilful and whimsical deities—dances, rituals, exorcisms and all manner of elaborate ceremonies

It must not be forgotten, however, that what we think of as barbarism was actually the first step toward civilization In man's realization of his ignorance lies the fertile seed of his desire to learn Having no background of knowlege to assist him, primitive man became an empiricist, he conceived a theory and proceeded on the assumption that it was true It is a habit not unknown to the scientists of today

The peoples indigenous to Mexico, before the coming of the Spanish conquerors, had acquired several of these unpredictable deities, each related in some way to the healing art Those of the two principal tribes dominated all life and all culture, including the military, until the Spaniards came A careful correlative study of the beliefs and practices associated with them reveals, in a most interesting light, the germinating seed of science already in existence

Among the Aztecs, Centeotl, mother of the gods and heart of the earth was god

Fig 1—Xipetotec, god of surgeons in Aztec mythology Florentine codex

*Professor of Clinical Surgery School of Medicine National University of Mexico Member of the Mexican Academy of Surgery and the National Academy of Sciences Mexico D F Mexico

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Fig. 2.—Gold mask of the god Xipetotec, found in tomb No. 7 of Monte Albán, Oaxaca.

dess not only of the corn but of medicine and medicinal plants. Special worship was accorded her by physicians, surgeons, blood-letters, midwives and soothsayers. Tzapotlatenan was goddess of medicine in general, grandmother of therapy and discoverer of the resin *oxitl* (turpentine), which was used to cure buboes, erosions of the scalp and chapping of the lips and hands. The tutelary deity of medicine was Xipetotec, among whose special devotees were surgeons and silversmiths, and who was thought to have power over abscesses, tumors and diseases of the eye.

In the Mayan mythology, Zamná, who partook of the natures of both God and man, was revered as the father and god of medicine. He formed a trinity with Ixchel and Citbolontún, co-discoverers, through a sacred marriage, of the medicinal virtues of plants.

The pre-Hispanic Indian physician was actually a type of witch, wizard or quack who assumed the doctor's role and performed the rites expected of him with little regard for vegetable remedies and no reliance on natural resources. In the National Museum of Anthropology of Mexico he is depicted in a ceramic exhibit that dates back to the preclassic or archaic period of the nation's history (3000 to 1000 B.C.).

Despite the fact that, like all primitive peoples, the early inhabitants of Mexico believed disease to be a manifestation of the god's anger, there is no lack of proof that they were capable of independent thought and investigation. Their powers of observation, as well as their artistic aptitudes, are magnificently represented by the relics they have left, of great antiquity and of many kinds: ceramics, jade, obsidian, marble, and painted frescoes. Some of these are on view at Mexican museums, particularly the National Museum of Anthropology of Mexico. The frescoes were discovered in various zones of anthropologic and archeologic interest within the national frontiers.

Indian materia medica has been the theme of brilliant and exhaustive studies, both during the colonial period and in later times. Nothing is lacking: all species of plants and animals employed in the treatment of disease are included in the evidence, together with the uses to which they were directed. So large, indeed, was the compendium of knowlege as to medicinal plants that its discovery brought about an immediate advancement and enrichment of therapeutics even in Europe, supplying European physicians with innumerable new pharmacologic resources and some specific remedies.

The early Mexican use of medicinal plants and herbs touched upon nearly all of the therapeutic indications accepted by the modern practitioner. The first descriptions, pictures and notes on the use of these plants were incorporated in the Badiano Codex (1552), written by the

Fig 3—A priest imparting medical knowledge to a group of Aztec citizens Mural of Chavez Morado in Ciba, of Mexico, D F

Aztec physician Martin de la Cruz in his own language and translated into Latin by another Indian physician, Juan Baldino Both men studied at the Imperial College of the Holy Cross of Tlaltelolco, the first such institution in all America

Ancient chroniclers also have repeatedly eulogized the Indian surgeons One of the most distinguished, Friar Toribio de Benavente, whom the Indians called Motolinia, refers to the ability and skill of the Aztec *tetezeles* In the Mexican museum collections and in the frescoes discovered by archeologists one can find evidence of original surgical technics, pictorially illustrated—trephining procedures, dental fillings and drills, fracture splints, bone-setting and bone-grafting operations, embryotomies, and many oph thalmologic interventions Friar Bernar dino de Sahagun made admiring reference to these in his *General History of the Affairs of New Spain*

Much has also been written of Indian principles and practices with regard to hygiene and general health, especially of certain civic mandates dealing with preventive medicine, dietetic norms and the uses of bathing The last-mentioned order covered not only the routine river and fountain bathing but the advantages of the steam bath (*temaz* [illegible] gienic or therapeutic purpose

Until the [illegible] rv frescoes, been iden

Fig. 4.—Decorative incision of the teeth and the ritual or medicinal bleeding (blood-letting) of the Aztecs. Mural of Chávez Morado in Ciba of México, D. F.

These frescoes, however, dating from the classic period of the so-called Old Mayan Empire (1000 B.C. to 600 A.D.), reveal many facts of great interest concerning the first wartime services among the ancient inhabitants of Mexico. For both tactical and religious reasons, the wounded were treated on the battlefield in order that they might be returned to combat without undue loss of time. This curiously modern concept is mentioned by Bernal Díaz del Castillo in his *True History of the Conquest of New Spain.*

That the medical and surgical history of Mexico covers many centuries is now beyond question. Its beginnings, from the modern point of view, are almost unimaginably remote, arising from a shadowy, legendary time when primitive men lived and toiled on the long, wide stretches of

Fig. 5.—Attention to parturition by the Aztec midwife, also from the mural of Chávez Morado in Ciba of Mexico.

that fabulous land of mystery, magic, omens and pilgrimages which has become Mexico as we know it today . . . . a land which the Indian theology ascended to the heavens while the witch doctor held undisputed sway over the afflicted on the hard ground of the earth.

—MANUEL A. MANZANILLA, M.D.,
F.I.C.S. (Hon.)
Mexico D. F., Mexico

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New Books

Books Received.—The following books have been received by the Editor; they will be reviewed critically as space and facilities permit. Omission of more extended review, however, is not to be taken as criticism of the merit of the book.

Kurze Heschichte der Vestibularisforschung (A Short History of Vestibular Research). By Ernst Wodak. Stuttgart: Georg Thieme Verlag, 1956. New York: Intercontinental Medical Book Corporation, 1956 (for United States and Canada). *Reviewed in this issue.*

Urology and Industry. By Leonard P. Wershub. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 130, with 20 pages of bibliography and index. *Reviewed in this issue.*

Clinical Urology for General Practice. By Justin J. Cordonnier. St. Louis: The C. V. Mosby Company, 1956. Pp. 252, with 47 illustrations. *Reviewed in this issue.*

Ankylosing Spondylitis: Clinical Considerations, Roentgenology, Pathologic Anatomy and Treatment. By J. Forestier, F. Jacqueline and J. Rotes-Querol. Translated by A. U. Desjardins. Springfield, Ill.: Charles C Thomas. Publisher, 1956. Pp. 374, with 145 illustrations.

Tumors of the Skin. By Herbert Conway. Springfield, Ill. Charles C Thomas, Publisher, 1956. Pp. 267. with 178 illustrations, 3 in color.

Supplement 1, Atlas of Exfoliative Cytology. By George N. Papanicolaou. Cambridge, Mass.: Harvard University Press, 1956. Looseleaf format, published for The Commonwealth Fund. *Reviewed in this issue.*

Handbook of Physical Therapy. By Robert Shestack. New York: Springer Publishing Company, Inc., 1956. Pp. 212.

I. International Secretions of the Pancreas. By the Editors of the Ciba Foundation. Pp. 292, with 100 illustrations. **II. Ageing in Transient Tissues.** By the same. Pp. 263, with 96 illustrations. Boston: Little, Brown & Company, 1956. *Reviewed in this issue.*

Traite de Technique Chirurgicale: Appareil Urinaire et Appareil Genital de l'Homme, Tome VIII (Treatise on Surgical Technique: The Male Genitourinary Apparatus, Volume 8). By Bernard Fey, Raymond Dossot and Louis Quenu. Paris: Masson et Cie, 1956. Pp. 870, with 899 illustrations.

A Manual of Oral Surgery: A Step-by-Step Atlas of Operative Techniques. By W. Harry Archer. Philadelphia and London: The W. B. Saunders Company, 1956. Pp. 877, with 1,400 illustrations. *Reviewed in this issue.*

Dermatology. By Donald N. Pillsbury, Walter B. Shelley and Albert N. Kligman. Philadelphia: The W. B. Saunders Company, 1956.

New Illustrated Practice of Surgery: Fasciscule IX. Edited by Jean Quenu. Paris: G. Doin et Cie, 1956. Pp. 264, with 227 illustrations.

The Dental Treatment of Maxillofacial Injuries. By William Kelsey and Terence Ward. Springfield, Ill.: Charles C Thomas, Publisher, 1956. 2d ed. Pp. 372, with 383 illustrations.

Head Injuries and Their Management. By Francis Asbury Echlin. Philadelphia: The J. B. Lippincott Company, 1956. Pp. 127, with 10 illustrations.

Neurological Nursing. By John Marshall Sr. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 166, with 83 illustrations.

I. Internal Secretions of the Pancreas By the Editors of the Ciba Foundation Pp 292, *with 100 illustrations* **II Ageing in Transient Tissues** By the same Pp 263, with 96 illustrations Boston Little, Brown & Company, 1956

The Ciba Foundation of London is an international center where outstanding investigators active in medical and biochemical research meet informally to exchange ideas and information The proceedings of these conferences are issued in book form Twenty four volumes have been published since 1947, the two above are the latest

Internal Secretions of the Pancreas is Volume 9 of the series of Colloquia on Endocrinology Seventeen papers are presented and discussed by leading physicists, chemists and biologists, dealing with the newest and most advanced phases of research in this field Most of the papers report on the chemical and physicochemical structure of insulin, the chemistry and biology of glucagon the transport of dextrose and other sugars across cell membranes under the effect of insulin and the control of the secretory activity of the islets of Langerhans Others are devoted to such topics as the hypophysis and blood insulin activity, the pancreatic islets and growth or the hepatic action of insulin giving the reader—even if he is not an active researcher—an authentic view of the main points of interest and progress in this field at present

Ageing in Transient Tissues is Volume 2 of the Colloquia on Ageing, Volume 1, *General Aspects of Ageing*, was published two years ago Twenty seven authorities from both sides of the Atlantic participated in this symposium The papers presented range from the physical instability and aging of human red blood cells to the metabolism of senescent leaves The age factor in certain prenatal events and in placental, ovarian and testicular tissues is prominently dealt with All papers and discussions are concerned with basic research—mainly biochemical and histologic—in the phenomena of aging in specific tissues or organs, and few immediate applications to the problems of clinical geriatricians are presented Nevertheless, they can hardly fail to be interested by some of the unorthodox and ingenious approaches, methods and technics used by these researchers and may be inspired to develop some new ideas that could be used in clinical observations or experiments A number of breath-takingly beautiful electron micrograms show various aspects of cytomorphosis

These works may be warmly recommended to all interested in the subject

HUGO R ROSEN, M D

Kurze Geschichte der Vestibularisforschung (A Brief History of Vestibular Research) By Ernst Wodak Stuttgart Georg Thieme Verlag 1956 New York International Medical Book Corp, for United States and Canada

Ernst Wodak's name is well known among otologists throughout the world and even more widely among neuro-otologists This devoted observer and investigator of neuro otology was the founder of the modern and extensive vestibular research in the German University of Prague in his native Czechoslovakia His countless publications, many written in collaboration with the physiologist M H Fischer, deal with various problems of vestibular physiology and pathology These contributions form a part of the first renaissance in vestibular research in Middle Europe in the first quarter of the century In 1939 Wodak moved to Israel, where, as the "grand old man" in otolaryngology, he maintains an active interest in the field

This monograph presents a brief but comprehensive survey of the history [illegible] research fi[illegible]ignos, who f[illegible] the human [illegible]anals Purkinje, following [illegible] lar investigato[illegible]

For a better and simpler survey, different chapters deal with past and present vestibular research in the various nations. Austria leads, having contributed many of the great discoveries. Holland, Czechoslovakia (with its school in Prague), the Scandinavian countries, Germany, Italy, England, Switzerland, Hungary and Russia are discussed in turn. The section concerning the contributions of the United States is the most voluminous and contains the longest (6 of a total of 36 pages) list among the fine bibliographic references included. Canada and Japan and the remainder of the world close the line of historical survey.

The delightful presentation of past and present knowledge of vestibular function makes this little volume most interesting to all concerned in medicine and surgery. It is particularly essential to the bookshelf of the otologist, the neuro-otologist and the medical historian.

FRANCIS L. LEDERER, M.D.

Urology and Industry. By Leonard P. Wershub. Springfield, Ill.: Charles C Thomas, Publisher, 1956. Pp. 130, with bibliography and index of 20 pages.

This new and interesting book is necessary to the industrial surgeon, enlightening to the urologist and revealing to the general practitioner, who may be the first to see and treat the industrial patient. It begins with the evolution of industrial medicine from its conception to the passage of workmen's compensation laws.

These laws state that there must be a causal relation between the injury and the employment. The author therefore describes the legal and medical evaluation of such a causal relation. In his opinion a thorough systematic review and analysis of the patient's history is the most important single aid in this evaluation. The history must show an injurious incident arising out of the employment, and it must demonstrate clearly that, after trauma or exposure, certain symptoms occurred which attracted attention at once by indicating that some degree of personal injury exists.

The text includes reports of 100 cases, illustrating many different types of urologic disease reported to have occurred in industry, and the author comments on the medicolegal aspect of each case. For the first time the urologist, the industrial surgeon, the lawyer and the general practitioner may have a convenient text for reference when the assessment of urologic disease and its association with compensation and industry is necessary.

BERNARD E. COHLER, M.D.

Clinical Urology for General Practice. By Justin J. Cordonnier. St. Louis: The C. V. Mosby Company, 1956. Pp. 252, with 47 illustrations.

This book is written especially for the general practitioner of medicine, for the medical student and for those interested in obtaining a fundamental and thoroughgoing knowledge of the field of urology. It covers the more common urologic diseases, and emphasis is placed on diagnosis and therapy.

It is not written for the well-trained urologic surgeon since it does not go into the technics of urologic surgery but describes in a clear, concise and easily understandable style the manner in which treatments are carried out. It describes adequately the means of diagnosing various urologic diseases and the treatment to be carried out. This book is a wonderful addition to the library of the general practitioner; it will not only add to his knowledge of urology but will enable him to decide which patients he can treat and which should be referred to the urologist.

Chapter 1 deals with steps in making a urologic diagnosis and is completely and accurately tabulated, so that, if it is followed as given, excellent insight as to the urologic disease present can be obtained. Well-reproduced roentgenograms are presented to illustrate the diseases discussed. For those who wish to enlarge their knowledge of urology, this book is highly recommended.

BERNARD E. COHLER, M.D.

A Manual of Oral Surgery: A Step-by-Step Atlas of Operative Techniques. By W. Harry Archer. Philadelphia and London: The W. B. Saunders Company, 1956. Pp. 877, with 1,400 illustrations.

Dr. Archer writes as an authority in this field. His book clearly and accurately accom-

plishes what the title indicates, "a step by-step atlas of operative technics" The text is illustrated by numerous drawings and photographs that quickly enable the reader to grasp the full meaning of the clear and practical textual matter

There is complete and adequate coverage of the field of oral surgery from the operative standpoint The book is well indexed, and the bibliography is extensive, complete and up to date The chapter on impactions is excellent and is considerably enhanced by diagrams and pictures The chapter on fractures explains diagnosis and differential diagnosis well but is somewhat lacking in detail as to operations other than the technics of external fixation The author's discussion of malignant neoplasms is well written

This book is recommended to the general practitioner as well as the student and the classroom instructor

ARNO LESHIN M D

Supplement I, Atlas of Exfoliative Cytology By George N Papanicolaou Published for the Commonwealth Fund by the Harvard University Press, Cambridge, Mass, 1956 With 16 illustrations in color

With this first supplement to the Atlas of Exfoliative Cytology, Dr Papanicolaou is not merely replacing old with new color plates but is improving the entire aspect of the Atlas, which has already met with such an enviable response

Special emphasis is placed upon the correlation of cytologic observations with histopathologic features The quality of the reproductions is as usual excellent The selection of the material is masterful

Every pathologist and clinician who is interested in cytology will be grateful to Dr Papanicolaou for his efforts to improve (if that is possible) such an excellent book

WERNER F EISENSTAEDT M D

Those who read me know my conviction that the world, the temporal world rests on a few very simple ideas, so simple that they must be as old as the hills It rests, notably, amongst others, on the idea of Fidelity At a time when nothing which is not revolutionary in some way or other can expect to attract much attention I have not been revolutionary in my writings The revolutionary spirit is mighty convenient in this, that it frees one from all scruples as regards ideas Its hard, absolute optimism is repulsive to my mind by the menace of fanaticism and intolerance it contains No doubt one should smile at these things, but imperfect Esthete I am no better Philosopher All claim to special righteousness awakes in me that scorn and anger from which a philosophical mind should be free

—Conrad

Abstracts from Current Literature

The Treatment of Disc Lesion of the Lumbar Spine. McGee, G. K., Lancet, 1:472, 1956.

The author presents a method of conservative treatment for disc lesions. It consists of combined traction and manipulation and the application of a polyethylene lumbar jacket. He describes the procedure in detail.

Briefly, he places the patient on the abdomen and applies traction of 70 to 100 pounds on a spring scale to the lumbar portion of the spine by applying a harness to to upper part of the torso and the pelvis or the ankles. The patient is on a specially designed table that separates in the middle, allowing approach to the lumbar area of the trunk; the table is also designed to hyperextend the patient, and the author apparently prefers this position. The preparation and application of the jacket are fully described.

The author does not state his criteria in determining the diagnosis of "prolapsed disc." His series consists of 50 cases, and his results are unusually good.

PAUL W. SHANNON, M.D.

Treatment of Cancer of the Nasal Cavity and Paranasal Sinuses. Hendrick, J. W., Surg., Gynec. & Obst. 102:1, 1956.

In this study of 72 cancers of the nasal fossa and paranasal sinuses the nasal fossa was involved only 8 times.

Chronic sinusitis and nasal polyps are frequently encountered, but there is no apparent relation between these conditions and cancer. Smoking has not been regarded as an etiologic factor.

The disease remains limited to the area above the clavicles until late in its course. The foremost method of extension is direct invasion of adjacent structures. Extension to the lymph nodes occurs late in the disease, in contrast to cancer involving the tongue and floor of the mouth. Hendrick has treated radiosensitive tumors with high voltage roentgen therapy.

Irradiation does not destroy primary carcinoma of the paranasal sinuses in a sufficient number of cases to warrant its use alone. This is true also of radical surgical excision of the superior maxilla, with or without exenteration of the orbit. A combination type of therapy should result in a more substantial nonrecurrence rate and remove the complications resulting from extensive irradiation when this is used alone.

In Hendrick's opinion, conservative surgical intervention has no place in the treatment of carcinoma of the paranasal sinuses. It is his practice to resect the superior maxilla, which frequently includes exenteration of the orbit. Areas that may contain residual carcinoma are treated with radium needles or tubes in rubber cots.

A split thickness skin graft is immediately applied to cover all raw surfaces of the cheek, the maxillary cavity and the orbit, and this maneuver has greatly improved the permanent results.

Postoperative care is enormously important, and a prosthesis prepared in advance by a dental surgeon is inserted to permit the patient to eat, drink and speak.

In Hendrick's series of 72 patients there were 64 with carcinoma of the paranasal sinuses. In 26 instances the diagnosis was made relatively early, while in 38 the disease was advanced, with destruction of one or more sinus walls and/or extension into the soft tissues of the cheek, nasal cavity, orbit or pterygoid fossa.

Forty patients were treated by irradiation followed by radical operation. Of the 19 who were operated upon over more than three years ago, 14 are living and well and free of disease. Two have died of recurrent carcinoma, 1 has been lost to follow-up and 2 have died of unrelated disease.

Fifteen patients were treated by irradiation only. Ten of these have been followed for three to six years. Six died of recurrent carcinoma; 2 are living and well but have com-

plications resulting from intensive irradiation, and 1 died of unrelated disease The remainder of the series have been treated for less than three years, and no statistical material is given for them

Of the 8 patients with carcinoma of the nasal fossa, 2 had lymphosarcoma, 1 lymphoepithelioma and 1 myxosarcoma Three of these were in advanced stages of the disease All 4 were treated with intensive irradiation and have died of the disease Two patients with squamous cell carcinoma, 1 with cylindroma and 1 with malignant melanoma were treated by making a lateral rhinotomy incision and removing the tumor thoroughly by an electrosurgical technic These 4 patients have been followed for three to six years and are clinically free of disease There was no operative mortality

THOMAS WILENSKY, M D

Lingual Goiter Hendrick J W Surgery 39:297, 1956

In the course of a personal experience with 1,309 thyroidectomies the author encountered 5 goiters in the lingual area and 5 in the sublingual area, between the base of the tongue and the hyoid bone Of the 5 lingual patients with goiter, 3 were female and all 5 were young, their ages ranging from 3 to 34 years

Symptoms varied with the size of the tumor and the age of the patient Voice changes, orthopnea and interference with deglutition were encountered One patient, a 34 year-old woman, had a rather severe hemorrhage during the latter months of pregnancy, resulting from ulceration of the buccal mucous membrane over the thyroid tumor All 5 patients complained of choking attacks and a feeling of fullness in the throat None exhibited toxicity Histologically, the resected tissue in 2 cases was similar to that of the parathyroid gland

In 2 of the 5 cases the tumors were located within the substance of the tongue In each case no tumor was visible in the region of the foramen cecum but there was fullness and thickness of the base of the tongue, with a pronounced enlargement in the submental area of the neck

In 2 cases the tumors were excised by the intraoral route, with the tongue pulled forward and the pharynx packed off after insertion of an intratracheal tube After excision of the tumor by the electrosurgical cutting current, the defect in the tongue was closed with interrupted heavy silk sutures

In 3 instances the tumor was removed through a median pharyngotomy incision (a transverse incision through the skin in the suprahyoid area) The external carotid arteries were exposed bilaterally and controlled with forceps, which permitted the excisional procedure to be conducted with minimal hemorrhage The muscles of the tongue were incised longitudinally until the tumor was reached

In 1 of these cases a papillary [illegible] noma was encountered in an [illegible] intralingual thyroid tumor Supp[illegible] section of the neck was added to t[illegible] without difficulty The patient ha[illegible] lowed for eight years with no indic[illegible] recurrence

The postoperative follow up revealed th[illegible] of the 5 patients required thyroid extract to control hypothyroidism The other 2 had sufficient cervical thyroid tissue for normal requirements

THOMAS WILENSKY M D

The Facial Nerve in Parotid Surgery Beahrs, O H, and L'Esperance B F JAMA 4:261, 1956

Total parotidectomy, with or without hemolateral radical dissection of the neck in continuity, in the opinion of the authors is the only satisfactory treatment for malignant lesions involving the gland The success of the extirpative procedure must not be jeopardized by fear of producing injury to the facial nerve and its branches When the parotid tumor is malignant the nerve should be sacrificed and the defect repaired by a graft taken preferably from the greater auricular nerve

In the authors' opinion, timid or unduly conservative operations are largely to blame for the high incidence of recurrence in practically all reported series The outstanding cause of such ineffectual operations has been fear of da[illegible] facial ner

Beahrs and L'Esperance maintain that the direct approach to parotid tumors for local excision or enucleation is contraindicated, as they consider it likely to result in incomplete excision of the lesion. In addition, the danger of nerve damage is actually increased, because of the lack of exposure. The safest and quickest technic consists in the development of generous skin flaps, after which the dissection is commenced at the posteroinferior border of the gland with identification of the stem of the facial nerve after it leaves the stylomastoid foramen. After the stem has been recognized, the superficial portion of the gland can be separated from its branches by blunt dissection, *with the nerve always under direct vision.* With this technic there is little occasion to stimulate the nerve.

If the tumor is situated in the deeper portion of the gland, total parotidectomy is indicated. When the tumor is benign, this can be accomplished with preservation of the facial nerve. If frozen sections reveal malignant change, the scope of the procedure must necessarily be extended, and in such instances it is almost always necessary to sacrifice the facial nerve in order to secure adequate excision of the tumor. Even in such instances, however, it is sometimes possible to preserve the nerve or a portion of it.

When the nerve is sacrificed, facial paralysis is the result. The serious disfigurement associated with this condition may be improved by several technics, including (1) nerve anastomosis or nerve grafts; (2) repair by muscle operation; (3) repair by use of supporting fascial strips, and (4) a combination of the two procedures last mentioned. In recent years the authors have inserted nerve grafts in selected cases, and in this communication they report on a 50-year-old man who has been followed for two years and in whom no noticeable cosmetic defect was present.

THOMAS WILENSKY, M.D.

Sterility and Retroversion. Standing, D. F., South African M. J. 30:382, 1956.

The author covers all the conditions associated with sterility and retroversion, in many of which the retroversion is incidental and the condition itself the cause of sterility. He deals first with the extreme instance of the idiopathic or the congenital type, for it is among these that one observes the greatest divergence from what is considered the normal position of the pelvic viscera.

The author tabulates the causes of sterility due to retroversion as follows: (1) Gross alterations in the tube's position in relation to the ovary; (2) kinking of the tube that prevents the ovum and the spermatoza from meeting; (3) thickening of the tunicae of the ovary, due to continuous trauma and preventing rupture of the Graafian follicle; (4) prevention of the formation of the corpus luteum, with upset of the menstrual cycle, and (5) severe dyspareunia with consequent infrequency of coitus.

The nonoperative treatment recommended is to insert a Hodge pessary and encourage the patient to sleep on her face, especially around the ovulation period. Surgical treatment should be an operation devised to rectify these malpositions in the individual case.

EDMUND LISSACK, M.D.

To know the truth partially is to distort the Universe. For example, the savage who can only count up to ten enormously exaggerates the importance of the small numbers, and so do we whose imaginations fail when we come to millions.

—Whitehead

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